2.6.1 Relevant documents pertaining to learning outcomes & graduate attributes

MEDICAL COUNCIL OF INDIA
REGULATIONS
ON
GRADUATE MEDICAL EDUCATION, 1997

(AMENDED UPTO MAY, 2018)

MEDICAL COUNCIL OF INDIA
Pocket-14, Sector 8, Dwarka
New Delhi - 110077

**(PUBLISHED IN PART III, SECTION 4
OF THE GAZETTE OF INDIA DATED 17TH MAY 1997*)**

Medical Council of India

The 4th March 1997

NOTIFICATION

In exercise of the powers conferred by Section 33 of the Indian Medical Council Act, 1956 (102 of 1956) the Medical Council of India with the previous sanction of the Central Government hereby makes the following regulations, namely :-

(1) Short title and commencement : (1) These regulations may be called the "Regulations on Graduate Medical Education, 1997".

(2) They shall come into force on the date of their publication in the Official Gazette.

*PAGES 1701 TO 1726

CHAPTER 1

2. GENERAL CONSIDERATIONS AND TEACHING APPROACH

(1) Graduate medical curriculum is oriented towards training students to undertake the responsibilities of a physician of first contact who is capable of looking after the preventive, promotive, curative & rehabilitative aspect of medicine.

(2) With wide range of career opportunities available today, a graduate has a wide choice of career opportunities. The training, though broad based and flexible should aim to provide an educational experience of the essentials required for health care in our country.

The following words have been added after sub-clause 2 after the words "care in our country"in terms of notification published on 15.12.2008 .

"Training should be able to meet internationally acceptable standards."

(3) To undertake the responsibilities of service situations which is a changing condition and of various types, it is essential to provide adequate placement training tailored to the needs of such services as to enable the graduates to become effective instruments of implementation of those requirements. To avail of opportunities and be able to conduct professional requirements, the graduate shall endeavour to have acquired basic training in different aspects of medical care.

(4) The importance of the community aspects of health care and of rural health care services is to be recognized. This aspect of education & training of graduates should be adequately recognized in the prescribed curriculum. Its importance has been systematically upgraded over the past years and adequate exposure to such experiences should be available throughout all the three phases of education & training. This has to be further emphasized and intensified by providing exposure to field practice areas and training during the intership period. The aim of the period of rural training during internship is to enable the fresh graduates to function efficiently under such settings.

(5) The educational experience should emphasize health and community orientation instead of only disease and hospital orientation or being-concentrated - on-curative -aspects. As such all the basic concepts of modern scientific medical education are to be adequately dealt with.

(6) There must be enough experiences to be provided for self learning. The methods and techniques that would ensure this must become a part of teaching-learning process.

(7) The medical graduate of modern scientific medicine shall endeavour to become capable of functioning independently in both urban or rural environment. He/she shall endeavour to give emphasis on fundamental aspects of the subjects taught and on common problems of health and disease avoiding unnecessary details of specialization.

(8) The importance of social factors in relation to the problem of health and diseases should receive proper emphasis throughout the course and to achieve this purpose, the educational process should also be community based than only hospital based. The importance of population control and family welfare planning should be emphasized throughout the period of training with the importance of health and development duly emphasized.

(9) Adequate emphasis is to be placed on cultivating logical and scientific habits of thought, clarity of expression and independence of judgment, ability to collect and analyse information and to correlate them.

(10) The educational process should be placed in a historic background as an evolving process and not merely as an acquisition of a large number of disjointed facts without a proper perspective. The history of Medicine with reference to the evolution of medical knowledge both in this country and the rest of the world should form a part of this process.

(11) Lectures alone are generally not adequate as a method of training and are a poor means of transferring/acquiring information and even less effective at skill development and in generating the appropriate attitudes. Every effort should be made to encourage the use of active methods related to demonstration and on first hand experience. Students will be encouraged to learn in small groups, through peer interactions so as to gain maximal experience through contacts with patients and the communities in which they live. While the curriculum objectives often refer to areas of knowledge or science, they are best taught in a setting of clinical relevance and hands on experience for students who assimilate and make this knowledge a part of their own working skills.

(12) The graduate medical education in clinical subjects should be based primarily on out-patient teaching, emergency departments and within the community including peripheral health care institutions. The out-patient departments should be suitably planned to provide training to graduates in small groups.

(13) Clinics should be organised in small groups of preferably not more than 10 students so that a teacher can give personal attention to each student with a view to improve his skill and competence in handling of the patients.

(14) Proper records of the work should be maintained which will form the basis for the students' internal assessment and should be available to the inspectors at the time of inspection of the college by the Medical Council of India.

(15) Maximal efforts have to be made to encourage integrated teaching between traditional subject areas using a problem based learning approach starting with clinical or community cases and exploring the relevance of various preclinical disciplines in both understanding and resolution of the problem. Every attempt be made to de-emphasize compartmentalisation of disciplines so as to achieve both horizontal and vertical integration in different phases.

(16) Every attempt is to be made to encourage students to participate in group discussions and seminars to enable them to develop personality, character, expression and other faculties which are necessary for a medical graduate to function either in solo practice or as a team leader when he begins his independent career. A discussion group should not have more than 20 students.

(17) Faculty member should avail of modern educational technology while teaching the students and to attain this objective, Medical Education Units/ Departments be established in all medical colleges for faculty development and providing learning resource material to teachers.

(18) To derive maximum advantage out of this revised curriculum, the vacation period to students in one calendar year should not exceed one month, during the 4 ½ years Bachelor of Medicine and Bachelor of Surgery (MBBS) Course.

(19) In order to implement the revised curriculum in toto, State Govts. and Institution Bodies must ensure that adequate financial and technical inputs are provided.

The following have been added after sub-clause 19 in terms of notification published on 15.12.2008 in the Gazette of India.

(20) HISTORY OF MEDICINE – The students will be given an outline on "History of Medicine". This will be taught in an integrated manner by subject specialists and will be coordinated by the Medical Education Unit of the College.

(21) All medical institutions should have curriculum committee which would plan curricula and instructional method which will be regularly updated.

(22) Integration of ICT in learning process will be implemented.

3. OBJECTIVE OF MEDICAL GRADUATE TRAINING PROGRAMME:

(1) **NATIONAL GOALS :** At the end of undergraduate program, the medical student should be able to :

(a) recognize `health for all' as a national goal and health right of all citizens and by undergoing training for medical profession fulfill his/her social obligations towards realization of this goal.

(b) learn every aspect of National policies on health and devote himself/herself to its practical implementation.

(c) achieve competence in practice of holistic medicine, encompassing promotive, preventive, curative and rehabilitative aspects of common diseases.

(d) develop scientific temper, acquire educational experience for proficiency in profession and promote healthy living.

(e) become exemplary citizen by observation of medical ethics and fulfilling social and professional obligations, so as to respond to national aspirations.

(2) **INSTITUTIONAL GOALS :** (I) In consonance with the national goals each medical institution should evolve institutional goals to define the kind of trained manpower (or professionals) they intend to produce. The undergraduate students coming out of a medical institute should:

(a) be competent in diagnosis and management of common health problems of the individual and the community, commensurate with his/her position as a member of the health team at the primary, secondary or tertiary levels, using his/her clinical skills based on history, physical examination and relevant investigations.

(b) be competent to practice preventive, promotive, curative and rehabilitative medicine in respect to the commonly encountered health problems.

(c) appreciate rationale for different therapeutic modalities, be familiar with the administration of the "essential drugs" and their common side effects.

(d) be able to appreciate the socio-psychological, cultural, economic and environmental factors affecting health and develop humane attitude towards the patients in discharging one's professional responsibilities.

(e) possess the attitude for continued self learning and to seek further expertise or to pursue research in any chosen area of medicine.

The above sub-clause 2(e) has been substituted in terms of notification published on 15.12.2008 in the Gazette of India and the same is as under:-

(e) possess the attitude for continued self learning and to seek further expertise or to pursue research in any chosen area of medicine, action research and documentation skills.

(f) be familiar with the basic factors which are essential for the implementation of the National Health Programmes including practical aspects of the following:

(i) Family Welfare and Material and Child Health(MCH)

(ii) Sanitation and water supply

(iii) Prevention and control of communicable and non-communicable diseases

(iv) Immunization

(v) Health Education

The following have been added after sub-clause 2(f)(v) in terms of notification published on 15.12.2008 in the Gazette of India .

(vi) IPHS standard of health at various level of service delivery, medical waste disposal.

(vii) Organizational institutional arrangements.

(g) acquire basic management skills in the area of human resources, materials and resource management related to health care delivery.

The above sub-clause 3(2)(g) has been substituted in terms of notification published on 15.12.2008 in the Gazette of India and the same is as under:-

(g) acquire basic management skills in the area of human resources, materials and resource management related to health care delivery, General and hospital management, principal inventory skills and counseling.

(h) be able to identify community health problems and learn to work to resolve these by designing, instituting corrective steps and evaluating outcome of such measures.

(i) be able to work as a leading partner in health care teams and acquire proficiency in communication skills.

(j) be competent to work in a variety of health care settings.

(j) have personal characteristics and attitudes required for professional life such as personal integrity, sense of responsibility and dependability and ability to relate to or show concern for other individuals.

(II) All efforts must be made to equip the medical graduate to acquire the skills as detailed in APPENDIX B.

CHAPTER II

ADMISSION, SELECTION, *COUNSELING*, MIGRATION & TRAINING:-

In above title, the word "COUNSELING " added in terms of Gazette notification dated 10.03.2017.

PREAMBLE

1. The Parliament of India has amended the Indian Medical Council Act, 1956 by the Indian Medical Council)Amendment(Act 2016. This Amendment Act after receiving the assent of the President has been notified in the Gazette of India on 5th August 2016. The Indian Medical Council)Amendment(Act, 2016 has inserted section 10 D and section 33)mb(to the Indian Medical Council Act, 1956. The said provision provides for a uniform entrance examination to all medical educational institutions at the under graduate level and post graduate level by the "designated authority". By virtue of this Amendment the Parliament has provided legislative sanctity to the National Eligibility-Cum-Entrance Test]hereinafter "NEET"[included in the Graduate Medical Education Regulations, 1997 by Amendments notified in the Official Gazette on 27th December 2010, 27th February 2012 and 23rd October 2013.

2. Earlier, the provisions relating to NEET were quashed by the Hon'ble Supreme Court vide its judgment dated 18th July 2013 in *Christian Medical College Vellore & Ors.vs. Union of India & Ors.*]TC)C(No. 98 of 2012 and other 114 connected Petitions[. However, on a Review Petition preferred by the Medical Council of India and the Union of India, the Hon'ble Supreme Court vide its order dated 11th April 2016 in Review Petition)C(Nos. 2059-2268 of 2013 captioned as *Medical Council of India vs. Christian Medical College Vellore & Ors.* has revived NEET Regulations. Furthermore, in pursuance of the Order dated 28th April 2016 of the Hon'ble Supreme Court in Writ Petition)Civil(Nos. 261 of 2016, captioned as *Sankalp Charitable Trust & Anr. vs. Union of India & Ors*, the National Eligibility-cum-Entrance Test for admission to the MBBS course were conducted for the academic year 2016-17. For admission to MBBS for academic year 2017-18, in terms of the Indian Medical Council)Amendment(Act, 2016 the National Eligibility-cum-Entrance Test is the uniform entrance examination to all medical educational institutions at the undergraduate level and shall continue to be the uniform entrance examination to all medical educational institutions at the undergraduate level.

The above have been added in terms of notification published on 23.01.2018 in Gazette of India

4. Admission to the Medical Course - Eligibility Criteria : No Candidate shall be allowed to be admitted to the Medical Curriculum proper of first Bachelor of Medicine and Bachelor of Surgery (MBBS) Course until:

(1) He/she shall complete the age of 17 years on or before 31st December of the year of admission to the MBBS Course.

The following shall be added after sub-clause 1 in terms of Notification dated 21.12.2010.

> ***"1 A. He/She has obtained a minimum of marks in National Eligibility-cum-Entrance Test as prescribed in Clause 5 of Chapter II."***

(The above notification was quashed by the Honble Supreme Court on 18.07.2013 and has been revived on 11.04.2016 by the Hon'ble Supreme Court.)

4. **Admission to the Medical Course-Eligibility Criteria**: No candidate shall be allowed to be admitted to the Medical Curriculum proper of first Bachelor of Medicine and Bachelor of Surgery course until he /she has qualified the National Eligibility Entrance Test, and he/she shall not be allowed to appear for the National Eligibility-Cum-Entrance Test until:

(1) He/she shall complete the age of 17 years on or before 31st December of the year of admission to the MBBS.

(1A) He/She has obtained a minimum of marks in National Eligibility-Cum-Entrance Test as prescribed in Clause 5 of Chapter II.

(IB) Provided further that in order to be eligible, the upper age limit for candidates appearing for National Eligibility Entrance Test and seeking admission to MBBS programme shall be 25 years as on the date of examination with a relaxation of 5 years for candidates belonging to SC/ST/OBC **category and persons entitled for reservation under the Rights of Persons with Disabilities Act, 2016**.

The above have been substituted in terms of notification published on 23.01.2018 in Gazette of India

(2) He/she has passed qualifying examination as under:

The following shall be added before words "He/She has passed qualifying examination as under" in terms of Notification dated 21.12.2010.

" In order to be eligible to take National Eligibility-cum-Entrance Test,"

(a) The higher secondary examination or the Indian School Certificate Examination which is equivalent to 10+2 Higher Secondary Examination after

a period of 12 years study, the last two years of study comprising of physics, Chemistry, Biology and Mathematics or any other elective subjects with English at a level not less than the core course for English as prescribed by the National Council for Educational Research and Training after the introduction of the 10+2+3 years educational structure as recommended by the National Committee on education.

The following proviso shall be added:

Provided that two years of regular and continuous study of Physics, Chemistry, Biology/Biotechnology taken together shall be required at 10+2 level for all the candidates. Candidates who have passed 10+2 from Open Schools or as Private candidates shall not be eligible to appear for National Eligibility-cum-Entrance Test. Furthermore, study of Biology/Biotechnology as an Additional Subject at 10+2 level also shall not permissible.

The above have been added in terms of notification published on 23.01.2018 in Gazette of India

Note: Where the course content is not as prescribed for 10+2 education structure of the National Committee, the candidates will have to undergo a period of one year pre-professional training before admission to the Medical colleges.

or

(b) The Intermediate examination in science of an Indian University/Board or other recognized examining body with Physics, Chemistry and Biology which shall include a practical test in these subjects and also English as a compulsory subject.

or

(c) The pre-professional/pre-medical examination with Physics, Chemistry and Biology, after passing either the higher secondary school examination, or the pre-university or an equivalent examination. The pre-professional/pre-medical examination shall include a practical test in Physics, Chemistry & Biology and also English as a compulsory subject.

or

(d) The first year of the three years degree course of a recognized university, with Physics, Chemistry and Biology including a practical test in these subjects provided the examination is a "University Examination" and candidate has passed 10+2 with English at a level not less than a core course.

or

(e) B.Sc examination of an Indian University, provided that he/she has passed the B.Sc examination with not less than two of the following subjects Physics, Chemistry, Biology (Botany, Zoology) and further that he/she has passed the earlier qualifying examination with the following subjects - Physics, Chemistry, Biology and English.

or

(f) Any other examination which, in scope and standard is found to be equivalent to the intermediate science examination of an Indian University/Board, taking Physics, Chemistry and Biology including practical test in each of these subjects and English.

Note:

The pre-medical course may be conducted either at Medical College or a Science College.

Marks obtained in mathematics are not to be considered for admission to MBBS course.

After the 10+2 course is introduced, the integrated courses should be abolished.

The above clause 4(2) has been substituted in terms of notification published on 03.11.2010 in Gazette of India and the same is as under:-

4(2) He/She has passed qualifying examination as under :-

(a) The higher secondary examination or the Indian School Certificate Examination which is equivalent to 10+2 Higher Secondary Examination after a period of 12 years study, the last two years of study comprising of Physics, Chemistry, Biology/Bio-technology and Mathematics or any other elective subjects with English at a level not less than core course of English as prescribed by the National Council of Educational Research and Training after the introduction of the 10+2+3 years educational structure as recommended by the National Committee on education;

Note: Where the course content is not as prescribed for 10+2 education structure of the National Committee, the candidates will have to undergo a period of one year pre-professional training before admission to the Medical colleges;

Or

(b) The intermediate examination in science of an Indian University/Board or other recognised examining body with Physics, Chemistry and Biology/Bio-technology which shall include a practical test in these subjects and also English as a compulsory subject;

Or

(c) The pre-professional/pre-medical examination with Physics, Chemistry and Biology/Bio-technology, after passing either the higher secondary school examination, or the pre-university or an equivalent Examination. The pre-professional/pre-medical examination shall include a practical test in Physics, Chemistry and Biology/Bio-technology and also English as a compulsory subject;

Or

(d) The first year of the three years degree course of a recognized university, with Physics, chemistry and Biology/Bio-technology including a practical test in three subjects provided the examination is a "University Examination" and candidate has passed 10+2 with English at a level not less than a core course;

Or

(e) B.Sc. examination of an Indian University, provided that he/she has passed the B.Sc. examination with not less than two of the following subjects Physics, Chemistry, Biology (Botany, Zoology)/Bio-technology and further that he/she has passed the earlier qualifying examination with the following subjects – Physics, Chemistry, Biology and English.

Or

(f) Any other examination which, in scope and standard is found to be equivalent to the intermediate science examination of an Indian University/Board, taking Physics, Chemistry and Biology/Bio-technology including practical test in each of these subjects and English.

Note:

The pre-medical course may be conducted either at Medical College, or a science College.

Marks obtained in Mathematics are not to be considered for admission to MBBS Course.

After the 10+2 course is introduced, the integrated courses should be abolished.

In terms of notification dated 21.12.2010, the sentence "Marks obtained in Mathematics are not to be considered for admission to MBBS Course." shall be deleted.

The following has been added after clause 2(f) in terms of the notification published on 25.03.2009 .

3. 3% seats of the annual sanctioned intake capacity shall be filled up by candidates with locomotory disability of lower limbs between 50% to 70%.

Provided that in case any seat in this 3% quota remains unfilled on account of unavailability of candidates with locomotory disability of lower limbs between 50% to 70% then any such unfilled seat in this 3% quota shall be filled up by persons with locomotory disability of lower limbs between 40% to 50% - before they are included in the annual sanctioned seats for General Category candidates.

Provided further that this entire exercise shall be completed by each medical college / institution as per the statutory time schedule for admissions and in no case any admission will be made in the MBBS course after 30th of September.

(3). In respect of candidates with benchmark disabilities specified under the Rights of Persons with Disabilities Act, 2016, the minimum marks in qualifying examination in Physics, Chemistry and Biology (or Botany and Zoology)/Bio-technology taken together in qualifying examination shall be 45% instead of 50%.

5% seats of the annual sanctioned intake capacity shall be filled up by candidates with benchmark disabilities in accordance with the provisions of the Rights of Persons with Disabilities Act, 2016, based on the merit list of 'National Eligibility-Cum-Entrance Test'. For this purpose the Specified Disability contained in the Schedule to the Rights of Persons with Disabilities Act, 2016 is annexed in Appendix 'G'.

Provided further that this entire exercise shall be completed by each medical college / institution as per the statutory time schedule for admissions and in no case any admission will be made in the MBBS course after 31st of August.

The above have been substituted in terms of notification published on 23.01.2018 in Gazette of India

5 Selection of Students: The selection of students to medical college shall be based solely on merit of the candidate and for determination of merit, the following criteria be adopted uniformly throughout the country:

(1) In states, having only one Medical College and one university / board/examining body conducting the qualifying examination, the marks obtained at such qualifying examination may be taken into consideration.

(2) In states, having more than one university/board/examining body conducting the qualifying examination (or where there is more than one medical college under the administrative control of one authority) a competitive entrance examination should be held so as to achieve a uniform evaluation as there may be variation of standards at qualifying examinations conducted by different agencies.

(3) Where there are more than one college in a state and only one university/board conducting the qualifying examination, then a joint selection board be constituted for all the colleges.

(4) A competitive entrance examination is absolutely necessary in the cases of Institutions of All India character.

In terms of notification dated 21.12.2010, In Chapter II, Clause 5 under the heading "Selection of Students", sub-clause (1) to (4) shall be deleted.

(5) Procedure for selection to MBBS course shall be as follows :-

i) In case of admission on the basis of qualifying examination under Clause(1) based on merit, candidate for admission to MBBS course must have passed in the subjects of Physics, Chemistry, Biology & English individually and must have obtained a minimum of 50% marks taken together in Physics, Chemistry, and Biology at the qualifying examination as mentioned in Clause(2) of regulation 4. In respect of candidates belonging to Scheduled Castes, Scheduled Tribes or Other Backward Classes, the marks obtained in Physics, Chemistry and Biology taken together in qualifying examination be 40% instead of 50% as above.

ii) In case of admission on the basis of competitive entrance examination under Clause (2) to (4) of this regulation, a candidate must have passed in the subjects of Physics, Chemistry, Biology and English individually and must have obtained a minimum of 50% marks taken together in Physics, Chemistry & Biology at the qualifying examination as mentioned in Clause (2) of Regulation 4 and in addition must have come in the merit list prepared as a result of such competitive entrance examination by securing not less than 50% marks in

Physics, Chemistry and Biology taken together in the competitive examination. In respect of candidates belonging to Scheduled Castes, Scheduled Tribes or other Backward Classes the marks obtained in Physics, Chemistry and Biology taken together in qualifying examination and competitive entrance examination be 40% instead of 50% as stated above.

Provided that a candidate who has appeared in the qualifying examination the result of which has not been declared, he may be provisionally permitted to take up the competitive entrance examination and in case of selection for admission to the MBBS course, he shall not be admitted to that course until he fulfils the eligibility criteria under Regulation 4.

The following has been added before the proviso to Clause 5(5)(ii) in terms of notification published on 25.03.2009.

Provided that the eligibility criteria for admission to persons with locomotory disability of lower limbs in terms of Clause 4(3) above – will be a minimum of 45% marks instead of 50% taken together in qualifying examination and competitive entrance examination for admission in MBBS course.

The Clause 5(5) has been substituted in terms of notification published on 03.11.2010 in Gazette of India and the same is as under:-

5(5) Procedure for selection to MBBS course shall be as follows:-

(i) In case of admission on the basis of qualifying examination under clause (1) based on merit, candidate for admission to MBBS course must have passed in the subjects of Physics, Chemistry, Biology/Bio-technology & English individually and must have obtained a minimum of 50% marks taken together in Physics, Chemistry and Biology/Bio-technology at the qualifying examination as mentioned in the clause (2) of regulation 4. In respect of candidates belonging to Scheduled Castes, Scheduled Tribes or Other Backward classes. The marks obtained in Physics, Chemistry and Biology/Bio-technology taken together in qualifying examination be 40% instead of 50% as above;

(ii) In case of admission of the basis of Competitive entrance examination under clause (2) to (4) of this regulation, a candidate must have passed in the subjects of Physics, Chemistry, Biology/Bio-technology and English individually and must have obtained a minimum of 50% of marks taken together in Physics Chemistry and Biology/Bio-technology at the qualifying examination as mentioned in clause (2) of

regulation 4 and in addition must have come in the merit list prepared as a result of such competitive entrance examination by securing not less then 50% marks in Physics, Chemistry and Biology/Bio-technology taken together in the competitive examination. In respect of candidates belonging to Schedule Caste, Schedule Tribes or other Backward Class the marks obtained in Physics, Chemistry, and Biology/Bio-technology taken together in qualifying examination and competitive entrance examination be 40% instead of 50% as stated above:

Provided that a candidate who has appeared in the qualifying examination the result of which has not been declared, he may be provisionally permitted to take up the competitive entrance examination and in case of selection for admission to the MBBS course, he shall not be admitted to that course until he fulfils the eligibility criteria under regulation 4."

The Clause 5(5) has been further substituted in terms of notification published on 21.12.2010 in Gazette of India and the same is as under:-

"I. There shall be a single eligibility cum entrance examination namely 'National Eligibility-cum-Entrance Test for admission to MBBS course' in each academic year. The overall superintendence, direction and control of National Eligibility-cum-Entrance Test shall vest with Medical Council of India. However, Medical Council of India with the previous approval of the Central Government shall select organization/s to conduct 'National Eligibility-cum-Entrance Test for admission to MBBS course.

II. In order to be eligible for admission to MBBS course for a particular academic year, it shall be necessary for a candidate to obtain minimum of 50% (Fifty Percent) marks in each paper of National Eligibility-cum-Entrance Test held for the said academic year. However, in respect of candidates belonging to Scheduled Castes, Scheduled Tribes and Other Backward Classes, the minimum percentage marks shall be 40% (Forty Percent) in each paper and in respect of candidates with locomotory disability of lower limbs, the minimum percentage marks shall be 45% (Forty Five Percent) in each paper of National Eligibility-cum-Entrance Test :

Provided when sufficient number of candidates belonging to respective categories fail to secure minimum marks as prescribed in National Eligibility-cum-Entrance Test in any academic year for admission to MBBS Course, the Central Government in consultation with Medical Council of India may, at its discretion, lower the minimum marks

required for admission to MBBS Course for candidates belonging to respective categories and marks so lowered by the Central Government shall be applicable for the said year only.

III. *The reservation of seats in medical colleges for respective categories shall be as per applicable laws prevailing in States/ Union Territories. An all India merit list as well as State-wise merit list of the eligible candidates shall be prepared on the basis of the marks obtained in National Eligibility-cum-Entrance Test and candidates shall be admitted to MBBS course from the said lists only.*

IV. *No Candidate who has failed to obtain the minimum eligibility marks as prescribed in Sub Clause (ii) above shall be admitted to MBBS Course in the said academic year.*

V. *All admissions to MBBS course within the respective categories shall be based solely on marks obtained in the National Eligibility-cum-Entrance Test."*

In the clause 5, sub-clause II, as amended vide notification No. MCI-31(1)/2010-Med/ 49068 dated 21st December 2010, the following shall be substituted as under, in terms of notification dated 15.02.2012.

"II. In order to be eligible for admission to MBBS Course for a particular academic year, it shall be necessary for a candidate to obtain minimum of marks at 50th percentile in 'National Eligibility-cum-Entrance Test to MBBS course' held for the said academic year. However, in respect of candidates belonging to Scheduled Castes, Scheduled Tribes, Other Backward Classes, the minimum marks shall be at 40th percentile. In respect of candidates with locomotory disability of lower limbs terms of Clause 4(3) above, the minimum marks shall be at 45th percentile. The percentile shall be determined on the basis of highest marks secured in the All-India common merit list in 'National Eligibility-cum-Entrance Test for admission to MBBS course'.

Provided when sufficient number of candidates in the respective categories fail to secure minimum marks as prescribed in National Eligibility-cum-Entrance Test held for any academic year for admission to MBBS Course, the Central Government in consultation with Medical Council of India may at its discretion lower the minimum marks required for admission to MBBS Course for candidates belonging to respective categories and marks so lowered by the

Central Government shall be applicable for the said academic year only."

In the clause 5, sub-clause II, as amended vide notification No. MCI-31(1)/2010-Med/ 49068 dated 21st December 2010, the following shall be added as under, in terms of notification dated 15.02.2012.

"VI. To be eligible for admission to MBBS course, a candidate must have passed in the subjects of Physics, Chemistry, Biology/Bio-technology and English individually and must have obtained a minimum of 50% marks taken together in Physics, Chemistry and Biology/Bio-technology at the qualifying examination as mentioned in clause (2) of Regulation 4 and in addition must have come in the merit list of "National Eligibility-cum-Entrance Test" for admission to MBBS course. In respect of candidates belonging to Scheduled Castes, Scheduled Tribes or other Backward Classes the minimum marks obtained in Physics, Chemistry and Biology/Bio-technology taken together in qualifying examination shall be 40% instead of 50%. In respect of candidates with locomotory disability of lower limbs in terms of Clause 4(3) above, the minimum marks in qualifying examination in Physics, Chemistry and Biology/Bio-technology taken together in qualifying examination shall be 45% instead of 50%.

Provided that a candidate who has appeared in the qualifying examination the result of which has not been declared, he/she may be provisionally permitted to take up the National Eligibility-cum-Entrance Test and in case of selection for admission to the MBBS course, he/she shall not be admitted to that course until he fulfils the eligibility criteria under Regulation 4.

VII. The Central Board of Secondary Education shall be the organization to conduct National Eligibility-cum-Entrance Test for admission to MBBS course."

(The above notification was quashed by the Honble Supreme Court on 18.07.2013 and has been revived on 11.04.2016 by the Hon'ble Supreme Court.)

The following shall be added , in terms of Gazette notification dated 10.03.2017.

5A Common Counseling.

(1) There shall be a common counseling for admission to MBBS course in all Medical Educational Institutions on the basis of merit list of the National Eligibility Entrance Test.

(2) The Designated Authority for counseling for the 15% All India Quota seats of the contributing States shall be the Directorate General of Health Services.

(3) The counseling for all admission to MBBS Course in all Medical Educational Institutions in a State/Union Territory, including Medical Educational Institutions established by the Central Government, State Government, University, Deemed University, Trust, Society/Minority Institutions/Corporations or a Company shall be conducted by the State/Union Territory Government. Such common counseling shall be under the over-all superintendence, direction and control of the State/Union Territory Government.

The above sub-clause '5A' (2) and (3) as added vide notification dated 10/03/2017, shall be substituted with the following vide Gazette notification dated 27.06.2017:-

Clause 5A (2), shall be substituted as under:-

The Designated Authority for counseling for the 15% All India Quota seats of the contributing States and all MBBS seats of Medical Educational Institutions of the Central Government, Universities established by an Act of Parliament and the Deemed Universities shall be the Directorate General of Health Services, Ministry of Health and Family Welfare, Government of India.

Clause 5A (3), shall be substituted as under:-

The counseling for admission to MBBS course in a State/Union Territory, including, Medical Educational Institutions established by the State Government, University established by an Act of State/Union Territory Legislature, Trust, Society, Minority Institutions, Municipal Bodies or a Company shall be conducted by the State/Union Territory Government.

The following shall be added in terms of notification published on 18.05.2018 in the Gazette of India

5A(4) – In order to prevent seat blocking in common counseling for admission to MBBS course and permissibility to exercise fresh choice during counseling, forfeiture of fee shall be in accordance with the Matrix contained in "Appendix – F".

5. "Procedure for selection to MBBS course shall be as follows:"

)1(There shall be a uniform entrance examination to all medical educational institutions at the under graduate level namely 'National Eligibility-cum-Entrance Test for admission to MBBS course in each academic year and shall be conducted under overall supervision of the Ministry of Health & Family Welfare, Government of India.

)2(The "designated authority" to conduct the 'National Eligibility-Cum-Entrance Test' shall be the Central Board of Secondary Education or any other body/organization so designated by the Ministry of Health & Family

Welfare, Government of India, in consultation with the Medical Council of India.

)3(The language and manner of conducting the 'National Eligibility-Cum-Entrance Test' shall be determined by the "designated authority" in consultation with the Medical Council of India and the Ministry of Health and Family Welfare, Government of India.

)4(In order to be eligible for admission to MBBS Course for a academic year, it shall be necessary for a candidate to obtain minimum of marks at 50th percentile in 'National Eligibility-cum-Entrance Test to MBBS course' held for the said academic year. However, in respect of candidates belonging to Scheduled Castes, Scheduled Tribes, Other Backward Classes, the minimum marks shall be at 40th percentile. In respect of candidates with benchmark disabilities specified under the Rights of Persons with Disabilities Act, 2016, in terms of Clause 4(3) above, the minimum marks shall be at 45th percentile. The percentile shall be determined on the basis of highest marks secured in the All-India common merit list for admission in 'National Eligibility-cum-Entrance Test for admission to MBBS course.

Provided when sufficient number of candidates in the respective categories fail to secure minimum marks as prescribed in National Eligibility-cum-Entrance Test held for any academic year for admission to MBBS Course, the Central Government in consultation with Medical Council of India may at its discretion lower the minimum marks required for admission to MBBS Course for candidates belonging to respective categories and marks so lowered by the Central Government shall be applicable for the said academic year only.

)5(The reservation of seats in Medical Colleges for respective categories shall be as per applicable laws prevailing in States/Union Territories. An All India merit list as well as State/Union Territory-wise merit list of the eligible candidates shall be prepared on the basis of marks obtained in 'National Eligibility-cum-Entrance Test and candidates shall be admitted to MBBS course from the said lists only.

)6(No candidate who has failed to obtain the minimum eligibility marks as prescribed in Sub-clause)4(above shall be admitted to MBBS course in the said academic year.

)7(No authority/institution shall admit any candidate to the MBBS course in contravention of the criteria/procedure as laid down by these Regulations and / or in violation of the judgments passed by the Hon'ble Supreme Court in respect of admissions. Any candidate admitted in contravention/violation of aforesaid shall be discharged by the Council forthwith. The authority / institution which grants admission to any student

in contravention / violation of the Regulations and / or the judgments passed by the Hon'ble Supreme Court, shall also be liable to face such action as may be prescribed by the Council, including surrender of seats equivalent to the extent of such admission made from its sanctioned intake capacity for the succeeding academic year/years.

)8(All admission to MBBS course within the respective categories shall be based solely on the marks obtained in the 'National Eligibility-Cum-Entrance Test.

The above have been substituted in terms of notification published on 23.01.2018 in Gazette of India

6. Migration

(1) Migration from one medical college to other is not a right of a student. However, migration of students from one medical college to another medical college in India may be considered by the Medical Council of India only in exceptional cases on extreme compassionate grounds*, provided following criteria are fulfilled. Routine migrations on other grounds shall not be allowed.

(2) Both the colleges, i.e. one at which the student is studying at present and one to which migration is sought, are recognised by the Medical Council of India.

(3) The applicant candidate should have passed first professional MBBS examination.

(4) The applicant candidate submits his application for migration, complete in all respects, to all authorities concerned within a period of one month of passing (declaration of results) the first professional Bachelor of Medicine and Bachelor of Surgery (MBBS) examination.

(5) The applicant candidate must submit an affidavit stating that he/she will pursue 18 months of prescribed study before appearing at IInd professional Bachelor of Medicine and Bachelor of Surgery (MBBS) examination at the transferee medical college, which should be duly certified by the Registrar of the concerned University in which he/she is seeking transfer. The transfer will be applicable only after receipt of the affidavit.

Note 1

(i) Migration during clinical course of study shall not be allowed on any ground.

(ii) All applications for migration shall be referred to Medical Council of India by college authorities. No institution / University shall allow migrations directly without the approval of the Council.

(iii) Council reserves the right, not to entertain any application which is not under the prescribed compassionate grounds and also to take independent decisions where applicant has been allowed to migrate without referring the same to the Council.

Note 2 : * Compassionate grounds criteria :

(i) Death of a supporting guardian.

(ii) Illness of the candidate causing disability.

(iii) Disturbed conditions as declared by Government in the Medical College area.

The above clause 6 has been substituted in terms of notification published on 20.10.2008 in Gazette of India and the same is as under:-

6. Migration

(1) Migration of students from one medical college to another medical college in India shall be granted only in exceptional cases to the most deserving among the applicants for good and sufficient reasons and not on routine grounds. The number of students migrating to/from any one medical college shall be kept to the minimum which shall in any case not exceed the limit of 5% of its sanctioned intake in one academic year. There shall be no migration on any ground from one medical college to another located in the same city.

(2) Migration of students from one College to another is permissible only if both the colleges are recognised by the Central Government under section 11(2) of the Indian Medical Council Act, 1956 and further subject to the condition that it shall not result in increase in the sanctioned intake capacity for the academic year concerned in respect of the receiving medical college.

(3) The applicant candidate shall be eligible to apply for migration only after qualifying in the first professional MBBS examination. Migration during clinical course of study shall not be allowed on any ground.

(4) For the purpose of migration, an applicant candidate shall first obtain 'No Objection Certificates' from the college where he is studying for the present, the University to which it is affiliated to, the college to which migration is sought and the University to which that college is affiliated to. He shall submit his application for migration within a period of one month of passing (declaration of results) of the first professional MBBS examination alongwith the said 'No Objection Certificates' to the Director, Medical Education of the State where the College/Institutions including Deemed Universities to which migration is sought is situated or to the Head of the Institution in case migration is sought to a Central Government institution. The Director, Medical Education of the State concerned or the Head of the Central Government institution, as the case may be, shall take a final decision in the matter as to whether or not to allow migration in accordance with the provisions of these Regulations and communicate the same to the applicant student within a period of one month from the date of receipt of the request for migration.

(5) A student who has joined another college on migration shall be eligible to appear in the IInd professional MBBS examination only after attaining the minimum attendance in that college in the subjects, lectures, seminars etc. required for appearing in the examination prescribed under Regulation 12(1)

Note-1: *The State Governments/Universities/Institutions may frame appropriate guidelines for grant of No Objection Certificate or migration, as the case may be, to the students subject to provisions of these regulations.*

Note-2: *Any request for migration not covered under the provisions of these Regulations shall be referred to the Medical Council of India for consideration on individual merits by the Director*

(Medical Education) of the State or the Head of Central Government Institution concerned. The decision taken by the Council on such requests shall be final.

Note-3: *The College/Institutions shall send intimation to the Medical Council of India about the number of students admitted by them on migration within one month of their joining. It shall be open to the Council to undertake verification of the compliance of the provisions of the regulations governing migration by the Colleges at any point of time.*

The above clause 6(1) and 6(4)have been further substituted in terms of notification published on 22.12.2008 in Gazette of India and the same is as under:-

6(1) Migration of students from one medical college to another medical college may be granted on any genuine ground subject to the availability of vacancy in the college where migration is sought and fulfilling the other requirements laid down in the Regulations. Migration would be restricted to 5% of the sanctioned intake of the college during the year. No migration will be permitted on any ground from one medical college to another located within the same city.

6(4) For the purpose of migration an applicant candidate shall first obtain "No Objection Certificate" from the college where he is studying for the present and the university to which that college is affiliated and also from the college to which the migration is sought and the university to it that college is affiliated. He/She shall submit his application for migration within a period of 1 month of passing (Declaration of result of the 1st Professional MBBS examination) alongwith the above cited four "No Objection Certificates" to: (a) the Director of Medical Education of the State, if migration is sought from one college to another within the same State or (b) the Medical Council of India, if the migration is sought from one college to another located outside the State.

7. Training Period and Time Distribution

(1) Every student shall undergo a period of certified study extending over 4 ½ academic years divided into 9 semesters,(i.e. of 6 months each) from the date of commencement of his study for the subjects comprising the medical curriculum to the date of completion of the examination and followed by one year compulsory rotating internship. Each semester will consist of approximately 120 teaching days of 8 hours each college working time, including one hour of lunch.

(2) The period of 4 ½ years is divided into three phases as follows :-

a) **Phase-1**(two semesters) - consisting of Pre-clinical subjects (Human Anatomy, Physiology including Bio-Physics, Bio- chemistry and introduction to Community Medicine including Humanities). Besides 60 hours for introduction to Community Medicine including Humanities, rest of the time shall be somewhat equally divided between Anatomy and Physiology plus Biochemistry combined (Physiology 2/3 & Biochemistry 1/3).

b) **Phase-II** (3 semesters) - consisting of para-clinical/ clinical subjects.

During this phase teaching of para-clinical and clinical subjects shall be done concurrently.

The para-clinical subjects shall consist of Pathology, Pharmacology, Microbiology, Forensic Medicine including Toxicology and part of Community Medicine.

The clinical subjects shall consist of all those detailed below in Phase III.

Out of the time for Para-clinical teaching approximately equal time be allotted to Pathology, Pharmacology, Microbiology and Forensic Medicine and Community Medicine combined (1/3 Forensic Medicine & 2/3 Community Medicine). See Appendix-C.

c) **Phase-III** (Continuation of study of clinical subjects for seven semesters after passing Phase-I)

The clinical subjects to be taught during Phase II & III are Medicine and its allied specialties, Surgery and its allied specialties, Obstetrics and Gynaecology and Community Medicine.

Besides clinical posting as per schedule mentioned herewith, rest of the teaching hours be divided for didactic lectures, demonstrations, seminars, group discussions etc. in various subjects. The time distribution shall be as per Appendix-C.

The Medicine and its allied specialties training will include General Medicine, Paediatrics, Tuberculosis and Chest, Skin and Sexually Transmitted Diseases, Psychiatry, Radio-diagnosis, Infectious diseases etc. The Surgery and its allied specialties training will include General Surgery, Orthopaedic Surgery including Physio-therapy and Rehabilitation, Ophthalmology, Otorhinolaryngology, Anaesthesia, Dentistry, Radio-therapy etc. The Obstetrics & Gynaecology training will include family medicine, family welfare planning etc.

(3) The first 2 semester (approximately 240 teaching days) shall be occupied in the Phase I (Pre-clinical) subjects and introduction to a broader understanding of the perspectives of medical education leading to delivery of health care. No student shall be permitted to join the Phase II (Para-clinical/clinical) group of subjects until he has passed in all the Phase I (Pre-clinical subjects) for which he will be permitted not more than four chances (actual examination), provided four chances are completed in three years from the date of enrollment.

In the above sub-section 7(3) the words "for which for which he will be permitted not more than four chances (actual examination), provided four chances are completed in three years from the date of enrollment" have been deleted in terms of notification published on 30.09.2003 in the Gazette of India .

(4) After passing pre-clinical subjects, 1 ½ year (3 semesters) shall be devoted to para-clinical subjects.

Phase II will be devoted to para-clinical & clinical subjects, along with clinical postings. During clinical phase (Phase III) pre-clinical and para-clinical teaching will be integrated into the teaching of clinical subjects where relevant.

(5) Didactic lectures should not exceed one third of the time schedule; two third schedule should include practicals, clinicals or/and group discussions. Learning process should include living experiences, problem oriented approach, case studies and community health care activities.

(6) Universities shall organize admission timings and admission process in such a way that teaching in first semester starts by 1st of August each year.

The above sub-section 7(6) has been substituted in terms of notification published on 01.03.2004 in the Gazette of India .

> ***"(6) The Universities and other authorities concerned shall organize admission process in such a way that teaching in first semester starts by Ist of August each year. For this purpose, they shall follow the time schedule indicated in APPENDIX E"***

The following sub-section 7(6)(A) and 6(B) have been included in terms of notification published on 01.03.2004 in the Gazette of India.

"(6A) There shall be no admission of students in respect of any academic session beyond 30th September under any circumstance. The Universities shall not register any student admitted beyond the said date.

(6B) the Medical Council of India may direct, that any student identified as having obtained admission after the last date for closure of admission be discharged from the course of study, or any medical qualification granted to such a student shall not be a recognized qualification for the purpose of the Indian Medical Council Act, 1956.

The institution which grants admission to any student after the last date specified from the same shall also be liable to face such action as may be prescribed by MCI including surrender of seats equivalent to the extent of such admission made from its sanctioned intake capacity for the succeeding academic year".

After sub clause 7(6A), the following shall be added in terms of Gazette notification dated 08.08.2016 as under:-

(6AA) – The Universities and other authorities concerned for the Academic year 2016-17 only shall organize admission process in accordance with the Time Schedule indicated in Appendix 'F'.

After sub clause 7(6AA), the following shall be added in terms of Gazette notification dated 04.07.2017 as under as under:-

(6AAA) – The Universities and other authorities concerned for the academic year 2017-18 only shall organise admission process in accordance with the Time Schedule indicated in Appendix 'F'.

The following shall be substituted in terms of Gazette notification dated 05.02.2018 as under:-

''7(6AAA) –The Universities and other authorities concerned shall organize admission process in accordance with the Time Schedule indicated in Appendix 'F'.''

(7) Supplementary examination may be conducted within 6 months so that the students who pass can join the main batch and the failed students will have to appear in the subsequent year.

The above sub-section 7(7) has been substituted in terms of notification published on 19.04.2010 in the Gazette of India .

"7(7) The supplementary examination for 1st Professional MBBS examination may be conducted within 6 months so that the students who pass can join the main batch and the failed students will have to appear in the subsequent year provided that the students who pass the supplementary examination shall be allowed to appear in the second professional MBBS examination only after he/she completes the full course of study of three semesters (i.e. 18 months) for the second professional MBBS examination irrespective of the examination of the main batch."

8. Phase Distribution and Timing of Examinations:-

6 MONTHS	6 MONTHS	6 MONTHS	
1	2		Ist professional examination (during second semester)
3	4	5	IInd professional examination (during fifth semester)
6	7		IIIrd professional Part I (during 7th semester)
8	9		IIIrd professional Part II (Final Professional).

Note:

a) Passing in Ist Professional is compulsory before proceeding to Phase II training.

b) A student who fails in the IInd professional examination, should not be allowed to appear IIIrd Professional Part I examination unless he passes all subjects of IInd Professional examination.

c) Passing in IIIrd Professional (Part I) examination is not compulsory before entering for 8th & 9th semester training, however passing of IIIrd Professional (Part I) is compulsory for being eligible for IIIrd Professional (Part II) examination.

During third to ninth semesters, clinical postings of three hours duration daily as specified in the Table below is suggested for various departments, after Introductory Course in Clinical Methods in Medicine & Surgery of two weeks each for the whole class.

TABLE

Total Subject:	3rd Semester (Wks)	4th Semester (Wks)	5th Semester (Wks)	6th Semester (Wks)	7th Semester (Wks)	8th Semester (Wks)	9th Semester (Wks)	Total (Wks)
General*** Medicine	6	-	4	-	4	6	6	26
Paediatrics	-	2	-	2	2	4	-	10
Tuberculosis And Chest Diseases	-	2	-	-	-	-	-	02
Skin & STD	-	2	-	2	-	2	-	06
Psychiatry	-	-	2	-	-	-	-	02
Radiology*	-	-	-	-	2	-	-	02
General **** Surgery	6	-	4	-	4	6	6	26
Orthopaedics**	-	-	4	4	-	-	2	10
Ophthalmology	-	4	-	4	-	-	2	10
Ear Nose And Throat	-	4	-	4	-	-	-	08
Obstetrics and Gynaecology including Family Welfare Planning	2	4	4	-	4	4	6	24
Community Medicine	4	4	-	4	-	-	-	12
Casualty	-	-	-	2	-	-	-	02
Dentistry	-	-	-	-	2	-	-	02
Total (in Weeks)	18	22	18	22	18	22	22	142

- Clinical methods in Medicine and Surgery for whole class will be for 2 weeks each respectively at the start of 3rd semester

* This posting includes training in Radiodiagnosis and Radiotherapy where existant.

** This posting includes exposure to Rehabilitation and Physiotherapy.

*** This posting includes exposure to laboratory medicine and infectious diseases.

**** This posting includes exposure to dressing and Anesthesia.

***** This includes maternity training and Family medicine and the 3rd semester posting shall be in Family Welfare Planning.

CHAPTER III

CURRICULUM (SUBJECT-WISE)

9. Pre-clinical subjects - Phase I : In the teaching of these subjects stress shall be laid on basic principles of the subjects with more emphasis on their applied aspects.

(1) HUMAN ANATOMY

(i) Goal

The broad goal of the teaching of undergraduate students in Anatomy aims at providing comprehensive knowledge of the gross and microscopic structure and development of human body to provide a basis for understanding the clinical correlation of organs or structures involved and the anatomical basis for the disease presentations.

ii) Objectives :

A) Knowledge :

At the end of the course the student should be able to

a. comprehend the normal disposition, clinically relevant interrelationships, functional and cross sectional anatomy of the various structures in the body.

b. identify the microscopic structure and correlate elementary ultra-structure of various organs and tissues and correlate the structure with the functions as a prerequisite for understanding the altered state in various disease processes.

c. comprehend the basic structure and connections of the central nervous system to analyse the integrative and regulative functions of the organs and systems. He/She should be able to locate the site of gross lesions according to the deficits encountered.

(d) demonstrate knowledge of the basic principles and sequential development of the organs and systems, recognise the critical stages of development and the effects of common teratogens, genetic mutations and environmental hazards. He/She should be able to explain the developmental basis of the major variations and abnormalities.

(B) Skills :

At the end of the course the student should be able to:

(a) identify and locate all the structures of the body and mark the topography of the living anatomy.

(b) identify the organs and tissues under the microscope.

(c) understand the principles of karyotyping and identify the gross congenital anomalies.

(d) understand principles of newer imaging techniques and interpretation of Computerised Tomography (CT) Scan, Sonogram etc.

(e) understand clinical basis of some common clinical procedures i.e., intramuscular & intravenous injection, lumbar puncture and kidney biopsy etc.

(C) **Integration**

From the integrated teaching of other basic sciences, student should be able to comprehend the regulation and integration of the functions of the organs and systems in the body and thus interpret the anatomical basis of disease process.

(2) HUMAN PHYSIOLOGY INCLUDING BIO-PHYSICS

(A) PHYSIOLOGY

i) GOAL

The broad goal of the teaching of undergraduate students in Physiology aims at providing the student comprehensive knowledge of the normal functions of the organ systems of the body to facilitate an understanding of the physiological basis of health and disease.

ii) OBJECTIVES

a) KNOWLEDGE

At the end of the course the student will be able to :

(1) explain the normal functioning of all the organ systems and their interactions for well coordinated total body function.

(2) assess the relative contribution of each organ system to the maintenance of the milieu interior.

(3) elucidate the physiological aspects of normal growth and development.

(4) describe the physiological response and adaptations to environmental stresses.

(5) list the physiological principles underlying pathogenesis and treatment of disease.

b) SKILLS

At the end of the course the student should be able to :

(1) conduct experiments designed for study of physiological phenomena.

(2) interpret experimental/investigative data.

(3) distinguish between normal and abnormal data derived as a result of tests which he/she has performed and observed in the laboratory.

c) INTEGRATION

At the end of the integrated teaching the student should acquire an integrated knowledge of organ structure and function and its regulatory mechanisms.

(B) BIOPHYSICS

(a) **GOAL & OBJECTIVES :** The broad goal of teaching Biophysics to undergraduate students is that they should understand basic physical principles involved in the functioning of body organs in normal and diseased conditions.

Total time for teaching Biophysics = 5 hours

Out of which : 1. Didactic lectures = 3 hours

2. Tutorial/group discussion = 1 hour

3. Practical = 1 hour

(b) Topic distribution

(1) Lectures :

(i) Physical principles of transport across cell memberanes and across capillary wall.

ii) Biopotentials.

iii) Physical principles governing flow of blood in heart and blood vessels.

Also physical principles governing flow of air in air passages.

2. Tutorial/group discussion: On the topic covered in didactic lectures.

3. Practicals:

Demonstration of :

a) Biopotential on oscilloscope

b) Electro Encephalogram (EEG)

c) Electro Myelogram (EMG)

d) Electro Cardiogram (ECG)

(3) **BIOCHEMISTRY**

Biochemistry including medical physics and Molecular Biology.

i) **GOAL**

The broad goal of the teaching of undergraduate students in biochemistry is to make them understand the scientific basis of the life processes at the molecular level and to orient them towards the application of the knowledge acquired in solving clinical problems.

ii) **OBJECTIVES**

a) **KNOWLEDGE**

At the end of the course, the student should be able to :

(1) describe the molecular and functional organization of a cell and list its subcellular components;

(2) delineate structure, function and inter-relationships of biomolecules and consequences of deviation from normal;

(3) summarize the fundamental aspects of enzymology and clinical application wherein regulation of enzymatic activity is altered;

(4) describe digestion and assimilation of nutrients and consequences of malnutrition;

(5) integrate the various aspects of metabolism and their regulatory pathways;

(6) explain the biochemical basis of inherited disorders with their associated sequelae;

(7) describe mechanisms involved in maintenance of body fluid and pH homeostasis;

(8) outline the molecular mechanisms of gene expression and regulation, the principles of genetic engineering and their application in medicine;

(9) summarize the molecular concepts of body defence and their application in medicine;

(10) outline the biochemical basis of environmental health hazards, biochemical basis of cancer and carcinogenesis;

(11) familiarize with the principles of various conventional and specialized laboratory investigations and instrumentation analysis and interpretation of a given data;

(12) the ability to suggest experiments to support theoretical concepts and clinical diagnosis.

b. SKILLS:

At the end of the course, the student should be able to :

(1) make use of conventional techniques/instruments to perform biochemical analysis relevant to clinical screening and diagnosis;

(2) analyze and interpret investigative data;

(3) demonstrate the skills of solving scientific and clinical problems and decision making;

c. **INTEGRATION**

The knowledge acquired in biochemistry should help the students to integrate molecular events with structure and function of the human body in health and disease.

(4) INTRODUCTION TO HUMANITIES & COMMUNITY MEDICINE

Including Introduction to the subjects of Demography, Health Economics, Medical Sociology, Hospital Management, Behavioral Sciences inclusive of Psychology.

OBJECTIVES

a) **KNOWLEDGE**

The student shall be able to :

1. explain the principles of sociology including demographic population dynamics;

2. identify social factors related to health, disease and disability in the context of urban and rural societies;

3. appreciate the impact of urbanization on health and disease;

4. observe and interpret the dynamics of community behavior;

5. describe the elements of normal psychology and social psychology;

6. observe the principles of practice of medicine in hospital and community setting;

(b). **SKILLS**

At the end of the course, the student should be able to make use of:

(1) Principles of practice of medicine in hospital and community settings and familiarization with elementary nursing practices.

(2) Art of communication with patients including history taking and medico-social work.

Teaching of community medicine, should be both theoretical as well as practical. The practical aspects of the training programme should include visits to the health establishments and to the community where health intervention programmes are in operation.

In order to inculcate in the minds of the students the basic concepts of community medicine to be introduced in this phase of training, it is suggested that the detailed curriculum drawn should include at least 30 hours of lectures, demonstrations, seminars etc. together with atleast 15 visits of two hours each.

10. PARA CLINICAL SUBJECTS OF PHASE II

9.1 **PATHOLOGY**:

i) **GOAL**

The broad goal of the teaching of undergraduate student in Pathology is to provide the students with a comprehensive knowledge of the mechanisms and causes of disease, in order to enable him/her to achieve complete understanding of the natural history and clinical manifestations of disease.

ii) **OBJECTIVES**

a) KNO**W**LEDGE

At the end of the course, the student should be able to :-

(1) describe the structure and ultrastructure of a sick cell, mechanisms of cell degeneration, cell death and repair and be able to correlate structural and functional alterations.

(2) explain the pathophysiological processes which govern the maintenance of homeostasis, mechanisms of their disturbance and the morphological and clinical manifestations associated with it.

3. describe the mechanisms and patterns to tissue response to injury such that she/he can appreciate the pathophysiology of disease processes and their clinical manifestations.

4. correlate normal and altered morphology (gross and microscopic) of different organ systems in common diseases to the extent needed for understanding of disease processes and their clinical significance.

b. **SKILLS**

At the end of the course, the student should be able to:-

1. describe the rationale and principles of technical procedures of the diagnostic laboratory tests and interpretation of the results;

2. perform the simple bed-side tests on blood, urine and other biological fluid samples;

3. draw a rational scheme of investigations aimed at diagnosing and managing the cases of common disorders;

4. understand biochemical/physiological disturbances that occur as a result of disease in collaboration with pre clinical departments.

c. **INTEGRATION**

At the end of training he/she should be able to integrate the causes of disease and relationship of different etiological factors (social, economic and environmental) that contribute to the natural history of diseases most prevalent in India.

9.2 **MICROBIOLOGY**

i) **GOAL**

The broad goal of the teaching of undergraduate students in Microbiology is to provide an understanding of the natural history of infectious disease in order to deal with the etiology, pathologenesis, laboratory diagnosis, treatment and control of infections in the community.

ii) OBJECTIVES

a. KNOWLEDGE

At the end of the course, the student should be able to:

1. state the infective micro-organisms of the human body and describe the host parasite relationship.

2. list pathogenic micro-organisms (bacteria, viruses, parasites, fungi) and describe the pathogenesis of the diseases produced by them.

3. state or indicate the modes of transmission of pathogenic and opportunistic organisms and their sources, including insect vectors responsible for transmission of infection.

4. describe the mechanisms of immunity to infections.

5. acquire knowledge on suitable antimicrobial agents for treatment of infections and scope of immunotherapy and different vaccines available for prevention of communicable diseases.

6. apply methods of disinfection and sterilization to control and prevent hospital and community acquired infections.

7. recommend laboratory investigations regarding bacteriological examination of food, water, milk and air.

(b). SKILLS

At the end of the course, the student should be able to:

1. plan and interpret laboratory investigations for the diagnosis of infectious diseases and to correlate the clinical manifestations with the etiological agent.

2. identify the common infectious agents with the help of laboratory procedures and use antimicrobial sensitivity tests to select suitable antimicrobial agents.

3. perform commonly employed bed-side tests for detection of infectious agents such as blood film for malaria, filaria, gram staining and AFB staining and stool sample for ova cyst.

4. Use the correct method of collection, storage and transport of clinical material for microbiological investigations.

c. **INTEGRATION**

The student should understand infectious diseases of national importance in relation to the clinical, therapeutic and preventive aspects.

(3) **PHARMACOLOGY**

i) **GOAL**:

The broad goal of the teaching of undergraduate students in Pharmacology is to inculcate a rational and scientific basis of therapeutics.

ii) **OBJECTIVES**

a. **KNOWLEDGE**

At the end of the course, the student should be able to:

1. describe the pharmacokinetics and pharmacodynamics of essential and commonly used drugs.

2. list the indications, contraindications, interactions and adverse reactions of commonly used drugs.

3. indicate the use of appropriate drug in a particular disease with consideration to its cost, efficacy and safety for

   i) individual needs.
   ii) mass therapy under national health program.

4. describe the pharmacokinetic basis, clinical presentation, diagnosis and management of common poisonings.

5. list the drugs of addiction and recommend the management.

6. classify environmental and occupational pollutants and state the management issues.

7. indicate causations in prescription of drugs in special medical situations such as pregnancy, lactation, infancy and old age.

8. integrate the concept of rational drug therapy in clinical pharmacology.

9. state the principles underlying the concept of 'Essential Drugs'

10. evaluate the ethics and modalities involved in the development and introduction of new drugs.

b. **SKILLS**

At the end of the course, the student should be able to:

1. prescribe drugs for common ailments.

2. recognise adverse reactions and interactions of commonly used drugs.

3. observe experiments designed for study of effects of drugs, bioassay and interpretation of the experimental data.

4. scan information on common pharmaceutical preparations and critically evaluate drug formulations.

c. **INTEGRATION**

Practical knowledge of use of drugs in clinical practice will be acquired through integrated teaching with clinical departments and pre clinical departments.

(4) FORENSIC MEDICINE INCLUDING TOXICOLOGY

i) **GOAL**;

The broad goal of the teaching of undergraduate students in Forensic Medicine is to produce a physician who is well informed about medicolegal responsibilities in practice of medicine. He/She will also be capable of making observations and inferring conclusions by logical deductions to set enquiries on the right track in criminal matters and connected medicolegal problems. He/She acquires knowledge of law in relation to medical practice, medical negligence and respect for codes of medical ethics.

ii) **OBJECTIVES**

a. **KNOWLEDGE**

At the end of the course, the student should be able to:

1. identify the basic medicolegal aspects of hospital and general practice.

2. define the medicolegal responsibilities of a general physician while rendering community service either in a rural primary health centre or an urban health centre.

3. appreciate the physician's responsibilities in criminal matters and respect for the codes of medical ethics.

4. diagnose, manage and identify also legal aspects of common acute and chronic poisonings.

5. describe the medicolegal aspects and findings of post-mortem examination in case of death due to common unnatural conditions & poisonings.

6. detect occupational and environmental poisoning, prevention and epidemiology of common poisoning and their legal aspects particularly pertaining to Workmen's Compensation Act.

7. describe the general principles of analytical toxicology.

The following has been added in terms of notification published on 15.12.2008 in the Gazette of India

8. Medical jurisprudence in view of the Consumer Protection Act – wherein doctors have been covered under its ambit. They have both rights as well as responsibilities. Under medical insurance acts of negligence covered as well as rights for effective service delivery.

b) SKILLS

At the end of the course, the student should be able to :-

1. make observations and logical inferences in order to initiate enquiries in criminal matters and medicolegal problems.

2. diagnose and treat common emergencies in poisoning and manage chronic toxicity.

3. make observations and interpret findings at postmortem examination.

4. observe the principles of medical ethics in the practise of his profession.

(c) **INTEGRATION**

Department shall provide an integrated approach towards allied disciplines like Pathology, Radiology, Forensic Sciences, Hospital Administration etc. to impart training regarding medicolegal responsibilities of physicians at all

levels of health care. Integration with relevant disciplines will provide scientific basis of clinical toxicology e.g. medicine, pharmacology etc.

(5) **COMMUNITY MEDICINE**

i) **GOAL :**

The broad goal of the teaching of undergraduate students in Community Medicine is to prepare them to function as community and first level physicians in accordance with the institutional goals.

ii) **OBJECTIVES**

a) **KNOWLEDGE**

At the end of the course, the student should be able to :-

(1) describe the health care delivery system including rehabilitation of the disabled in the country;

(2) describe the National Health Programmes with particular emphasis on maternal and child health programmes, family welfare planning and population control.

(3) list epidemiological methods and describe their application to communicable and non-communicable diseases in the community or hospital situation.

(4) apply biostatistical methods and techniques;

(5) outline the demographic pattern of the country and appreciate the roles of the individual, family, community and socio-cultural milieu in health and disease.

(6) describe the health information systems.

(7) enunciate the principles and components of primary health care and the national health policies to achieve the goal of 'Health for All'.

(8) identify the environmental and occupational hazards and their control.

(9) describe the importance of water and sanitation in human health.

(10) to understand the principles of health economics, health administration, health education in relation to community.

b) **SKILLS**

At the end of the course, the student should be able to :-

(1) use epidemiology as a scientific tool to make rational decisions relevant to community and individual patient intervention.

(2) collect, analyse, interpret and present simple community and hospital based data.

(3) diagnose and manage common health problems and emergencies at the individual, family and community levels keeping in mind the existing health care resources and in the context of the prevailing socio-cultural beliefs.

(4). diagnose and manage maternal and child health problems and advise a couple and the community on the family planning methods available in the context of the national priorities.

(5) diagnose and manage common nutritional problems at the individual and community level.

(6) plan, implement and evaluate a health education programme with the skill to use simple audio-visual aids.

(7) interact with other members of the health care team and participate in the organisation of health care services and implementations of national health programmes.

c). **INTEGRATION** ;

Develop capabilities of synthesis between cause of illness in the environment or community and individual health and respond with leadership qualities to institute remedial measures for this.

11. CLINICAL SUBJECTS OF PHASE II & PHASE III

The teaching and training in clinical subjects will commence at the beginning of Phase II and continue throughout

The clinical subjects will be taught to prepare the MBBS graduates to understand and manage clinical problems at the level of a practitioner. Exposure to subject matter will be limited to orientation and knowledge required of a general doctor. Maximum attention to the diagnosis and management of the most common and important conditions encountered in general practice should be emphasised in all clinical subject areas. Instructions in clinical subjects should be given both in out patient and in-patient during clinical posting.

Each of the clinical departments shall provide integrated teaching calling on pre-clinical, para-clinical and other clinical departments to join in exposing the students to the full range of disciplines relevant to each clinical area of study. Problem approach will be emphasised based on basic social sciences and a continuation of clinical and laboratory syllabi to optimally understand and manage each clinical condition.

The course shall comprise of:

(1) MEDICINE & ITS ALLIED SPECIALITIES;

(A) **MEDICINE**:

i) **GOAL**:

The broad goal of the teaching of undergraduate students in Medicine is to have the knowledge, skills and behavioral attributes to function effectively as the first contact physician.

ii) **OBJECTIVES**

(a) **KNOWLEDGE**

At the end of the course, the student should be able to:

(1) diagnose common clinical disorders with special reference to infectious diseases, nutritional disorders, tropical and environmental diseases.

(2) outline various modes of management including drug therapeutics especially dosage, side effects, toxicity, interactions, indications and contra-indications.

(3) propose diagnostic and investigative procedures and ability to interpret them.

(4) provide first level management of acute emergencies promptly and efficiently and decide the timing and level of referral, if required.

(5) recognize geriatric disorders and their management.

b. **SKILLS**;

At the end of the course, the student should be able to:

(1) develop clinical skills (history taking, clinical examination and other instruments of examination) to diagnose various common medical disorders and emergencies.

(2) refer a patient to secondary and/or tertiary level of health care after having instituted primary care.

(3) perform simple routine investigations like haemogram, stool, urine, sputum and biological fluid examinations.

(4) assist the common bedside investigative procedures like pleural tap, lumbar puncture, bone marrow aspiration/biopsy and liver biopsy.

c. **INTEGRATION**;

(1) with community medicine and physical medicine and rehabilitation to have the knowledge and be able to manage important current national health programs, also to be able to view the patient in his/her total physical, social and economic milieu.

(2) with other relevant academic inputs which provide scientific basis of clinical medicine e.g. anatomy, physiology, biochemistry, microbiology, pathology and pharmacology.

(B) **PEDIATRICS**

Pediatrics including Neonatology

The course includes systematic instructions in growth and development, nutritional needs of a child, immunization schedules and management of common diseases of infancy and childhood, scope of Social Pediatrics and counselling.

i) **GOAL**

The broad goal of the teaching of undergraduate students in Pediatrics is to acquire adequate knowledge and appropriate skills for optimally dealing with major health problems of children to ensure their optimal growth and development.

ii) **OBJECTIVES**

a. **KNOWLEDGE**

At the end of the course, the student should be able to:

(1) describe the normal growth and development during foetal life, neonatal period, childhood and adolescence and outline deviations thereof.

(2) describe the common paediatric disorders and emergencies in terms of epidemiology, etiopathogenesis, clinical manifestations, diagnosis, rational therapy and rehabilitation.

(3) state age related requirements of calories, nutrients, fluids, drugs etc. in health and disease.

(4) describe preventive strategies for common infectious disorders, malnutrition, genetic and metabolic disorders, poisonings, accidents and child abuse.

(5) outline national programmes relating to child health including immunisation programmes.

b. **SKILLS**

At the end of the course, the student should be able to:

(1) take a detailed pediatric history, conduct an appropriate physical examination of children including neonates, make clinical diagnosis, conduct common bedside investigative procedures, interpret common laboratory investigation results and plan and institute therapy.

(2) take anthropometric measurements, resuscitate newborn infants at birth, prepare oral rehydration solution, perform tuberculin test, administer vaccines available under current national programs, perform venesection, start an intravenous saline and provide nasogastric feeding.

(3) conduct diagnostic procedures such as lumbar puncture, liver and kidney biopsy, bone marrow aspiration, pleural tap and ascitic tap.

(4) distinguish between normal newborn babies and those requiring special care and institute early care to all new born babies including care of preterm and low birth weight babies, provide correct guidance and counselling in breast feeding.

(5). provide ambulatory care to all sick children, identify indications for specialized/inpatient care and ensure timely referral of those who require hospitalization.

(c). **INTEGRATION**

The training in pediatrics should prepare the student to deliver preventive, promotive, curative and rehabilitative services for care of children both in the community and at hospital as part of a team in an integrated form with other disciplines, e.g. Anatomy, Physiology, Biochemistry, Microbiology, Pathology, Pharmacology, Forensic Medicine, Community Medicine and Physical Medicine and Rehabilitation.

(C) PSYCHIATRY

i) GOAL

The aim of teaching the undergraduate student in psychiatry is to impart such knowledge and skills that may enable him to diagnose and treat common psychiatric disorders, handle psychiatric emergencies and to refer complications/unusual manifestations of common disorders and rare psychiatric disorders to the specialist.

ii) OBJECTIVES

a. KNOWLEDGE

At the end of the course, the student should be able to:

(1) comprehend nature and development of different aspects of normal human Behaviour like learning, memory, motivation, personality and intelligence;

(2) recognize differences between normal and abnormal behaviour;

(3) classify psychiatric disorders;

(4). recognize clinical manifestations of the following common syndromes and plan their appropriate management of organic psychosis, functional psychosis, schizo-phrenia, affective disorders, neurotic disorders, personality disorders, psycho-physiological disorders, drug and alcohol dependence, psychiatric disorders of childhood and adolescence;

(5) describe rational use of different modes of therapy in psychiatric desorders.

b. **SKILLS**;

The student should be able to:

(1) interview the patient and understand different methods of communications in patient-doctor relationship;

(2) elicit detailed psychiatric case history and conduct clinical examination for assessment of mental status;

(3) define, elicit and interpret psycho-pathological symptoms and signs.

(4) diagnose and manage common psychiatric disorders;

(5) identify and manage psychological reactions and psychiatric disorderes in medical and surgical patients in clinical practice and in community setting.

c. **INTEGRATION**;

Training in Psychiatry should prepare the students to deliver preventive, promotive, curative and re-habilitative services for the care of patients both in the family and community and to refer advance cases to a pecialised Psychiatry/Mental Hospital. Training should be integrated with the departments of Medicine, Neuro Anatomy, Behavioral Sciences and Forensic medicine.

D DERMATOLOGY AND SEXUALLY TRANSMITTED DISEASES

I) **GOAL**:

The aim of teaching the undergraduate student in Dermatology, S.T.D. and Leprology is to impart such knowledge and skills that may enable him to diagnose and treat common ailments and to refer rare diseases or complications/unusual manifestations of common diseases, to the specialist.

ii) **OBJECTIVES:**

a. **KNOWLEDGE:**

At the end of the course of Dermato-S.T.D. and Leprology, the student Shall be able to:

1. demonstrate sound knowledge of common diseases, their clinical manifestations, including emergent situations and of investigative procedures to confirm their diagnosis:

2. demonstrate comprehensive knowledge of various modes of therapy used in treatment of respiratory diseases;

3. describe the mode of action of commonly used drugs, their doses, side-effects/toxicity, indications and contra-indications and interactions;

4. describe commonly used modes of management including the medical and surgical procedures available for the treatment of various diseases and to offer a comprehensive plan of management for a given disorder;

b. **SKILLS:**

The student should be able to:

1. interview the patient, elicit relevant and correct information and describe the history in a chronological order.

2. conduct clinical examination, elicit and interpret physical findings and diagnose common disorders and emergencies;

3. perform simple, routine investigative and office procedures required for making the bed-side diagnosis, especially the examination of scrapings for fungus, preparation of slit smears and staining for AFB for leprosy patients and for STD cases;

4. take a skin biopsy for diagnostic purposes;

5. manage common diseases recognizing the need for referral for specialized care, in case of inappropriateness of therapeutic response;

6. assist in the performance of common procedures, like laryngoscopic examination, pleural aspiration, respiratory physiotherapy, laryngeal intubation and pneumo-thoracic drainage/aspiration.

c. **INTEGRATION:**

The broad goal of effective teaching can be obtained through integration with departments of Medicine, Surgery, Microbiology, Pathology, Pharmacology and Preventive & Social Medicine.

(2) **SURGERY & ITS ALLIED SPECIALITIES**

(A) **SURGERY** - including Paediatric Surgery:

i) **GOAL:**

The broad goal of the teaching of undergraduate students in Surgery is to produce graduates capable of delivering efficient first contact surgical care.

ii) **OBJECTIVES:**

a. **KNOWLEDGE:**

At the end of the course, the student should be able to:

1. describe aetiology, pathophysiology, principles of diagnosis and management of common surgical problems including emergencies, in adults and children.

2. define indications and methods for fluid and electrolyte replacement therapy including blood transfusion.

3. define asepsis, disinfection and sterilization and recommended judicious use of antibiotics.

4. describe common malignancies in the country and their management including prevention.

5. enumerate different types of anaesthetic agents, their indications, mode of administration, contraindications and side effects.

b. **SKILLS:**

At the end of the course, the student should be able to:

1. diagnose common surgical conditions both acute and chronic, in adult and children.

2. plan various laboratory tests for surgical conditions and interpret the results.

3. identify and manage patients of hemorrhagic, septicaemic and other types of shock.

4. be able to maintain patent air-way and resuscitate

i) a critically injured patient
ii) ii) patient with cardio-respiratory failure
iii) iii) a drowning case

5. monitor patients of head, chest, spinal and abdominal injuries, both in adults and children.

6. provide primary care for a patient of burns.

7. acquire principles of operative surgery, including pre-operative, operative and post operative care and monitoring.

8. treat open wounds including preventive measures against tetanus and gas gangrene.

9. diagnose neonatal and pediatric surgical emergencies and provide sound primary care before referring the patient to secondary/tertiary centres.

10. identify congenital anomalies and refer them for appropriate management.

In addition to these he should have observed/assisted/ performed the following:

1. Incision and drainage of abscess
2. Debridement and suturing open wound
3. Venesection
4. Excision of simple cyst and tumours
5. Biopsy of surface malignancy
6. Catheterisation and nasogastric intubation
7. Circumcision
8. Meatotomy
9. Vasectomy
10. Peritoneal and pleural aspirations
11. Diagnostic proctoscopy
12. Hydrocele operation
13. Endotracheal intubation
14. Tracheostomy and cricothyreidotomy
15. Chest tube insertion.

(c). **INTEGRATION**:

The undergraduate teaching in surgery should be integrated at various stages with different pre and para and other clinical departments.

B. **ORTHOPEDICS**:

a. **KNOWLEDGE:**

The student should be able to:

1. explain the principles of recognition of bone injuries and dislocation.

2. apply suitable methods to detect and manage common infections of bones and joints.

3. identify congenital, skeletal anomalies and their referral for appropriate correction or rehabilitation.

4. recognize metabolic bone diseases as seen in this country.

5. explain etiogenesis, manifestations, diagnosis of neoplasm affecting bones.

b. **SKILLS**

At the end of the course, the student should be able to:

1. Detect sprains and deliver first aid measures for common fractures and sprains and manage uncomplicated fractures of clavicle, Colles's, forearm, phallanges etc.

2. Techniques of splinting, plaster, immobilization etc.

3. Management of common bone infections, learn indications for sequestration, amputations and corrective measures for bone deformities.

4. Aspects of rehabilitation for Polio, Cerebral Palsy and Amputation.

c. **APPLICATION:**

Be able to perform certain orthopedic skills, provide sound advise of skeletal and related conditions at primary or secondary health care level.

d. **INTEGRATION:**

Integration with anatomy, surgery, pathology, rediology and Forensic Medicine be done.

C. **RADIO-DIAGNOSIS AND RADIOTHERAPY**

A **RADIODIAGNOSIS & IMAGING:**

i) **GOAL**:

The broad goal of teaching the undergraduate medical students in the field of Radio-diagnosis should be aimed at making the students realise the basic need of various radio-diagnostic tools in medical practice. They should be aware of the techniques required to be undertaken in different situations for the diagnosis of various ailments as well as during prognostic estimations.

ii) **OBJECTIVES**

a. **KNOWLEDGE**:

The student should be able to:

1. understand basics of X-ray production, its uses and hazards.

2. appreciate and diagnose changes in bones - like fractures, infections, tumours and metabolic bone diseases.

3. identify and diagnose various radiological changes in disease conditions of chest and mediastinum, skeletal system, G.I. Tract, Hepatobiliary system and G.U. system.

4. learn about various imaging techniques, including isotopes C.T., Ultrasound, M.R.I. and D.S.A.

b. **SKILL**

At the end of the course the student should be able to:

1. use basic protective techniques during various imaging procedures.

2. Interpret common X-ray, radio-diagnostic techniques in various community situations.

3. advise appropriate diagnostic procedures in specialized circumstances to appropriate specialists.

B **RADIOTHERAPY**

i) **GOAL:**

The broad goal of teaching the undergraduate medical students in the field of Radiotherapy is to make the students understand the magnitude of the ever-increasing cancer problem in the country. The students must be made aware about steps required for the prevention and possible cure of this dreaded condition.

ii) **OBJECTIVES**

a. **KNOWLEDGE:**

The students should be able to:

1. identify symptoms and signs of various cancers and their steps of investigations and management.

2. explain the effect of radiation therapy on human beings and the basic principles involved in it.

3. know about radio-active isotopes and their physical properies

4. be aware of the advances made in radiotherapy in cancer management and knowledge of various radio therapeutic equipment while treating a patient.

b. **SKILL:**

At the completion of the training programme, the student should be able to:

1. take a detailed clinical history of the case suspected of having a malignant disease.

2. assist various specialists in administration of anticancer drugs and in application and use of various radiotherapeutic equipment, while treating a patient.

(3) **OTO-RHINO-LARYNGOLOGY**

i) **GOAL:**

The broad goal of the teaching of undergraduate students in Otorhinolaryngology is that the undergraduate student have acquired adequate knowledge and skills for optimally dealing with common disorders and emergencies and principles of rehabilitation of the impaired hearing.

ii) **OBJECTIVES**

a. **KNOWLEDGE**

At the end of the course, the student should be able to:

1. describe the basic pathophysiology of common ENT diseases and emergencies.

2. adopt the rational use of commonly used drugs, keeping in mind their adverse reactions.

3. suggest common investigative procedures and their interpretation.

b. **SKILLS**

At the end of the course, the student should be able to:

1. examine and diagnose common ENT problems including the pre-malignant and malignant disorders of the head and neck.

2. manage ENT problems at the first level of care and be able to refer whenever necessary.

3. Assist/carry out minor surgical procedures like ear syringing, ear dressings, nasal packing etc.

4. assist in certain procedures such as tracheostomy, endoscopies and removal of foreign bodies.

c. **INTEGRATION:**

The undergraduate training in ENT will provide an integrated approach towards other disciplines especially neurosciences, ophthalmology and general surgery.

4. **OPHTHALMOLOGY**

i) **GOAL**:

The broad goal of the teaching of students in ophthalmology is to provide such knowledge and skills to the students that shall enable him to practice as a clinical and as a primary eye care physician and also to function effectively as a community health leader to assist in the implementation of National Programme for the prevention of blindness and rehabilitation of the visually impaired.

ii) **OBJECTIVES**

a. **KNOWLEDGE**

At the end of the course, the student should have knowledge of:

1. common problems affecting the eye:

2. principles of management of major ophthalmic emergencies

3. main systemic diseases affecting the eye

4. effects of local and systemic diseases on patient's vision

and the necessary action required to minimise the sequalae of such diseases;

5. adverse drug reactions with special reference to ophthalmic manifestations;

6. magnitude of blindness in India and its main causes;

7. national programme of control of blindness and its implementation at various levels

8. eye care education for prevention of eye problems

9. role of primary health centre in organization of eye camps

10. organization of primary health care and the functioning of the ophthalmic assistant.

11. integration of the national programme for control of blindness with the other national health programmes;

12. eye bank organization

b. **SKILLS**:

At the end of the course, the student should be able to:

1. elicit a history pertinent to general health and ocular status;

2. assist in diagnostic procedures such as visual acuity testing, examination of eye, Schiotz tonometry, Staining for Corneal pathology, confrontation perimetry, Subjective refraction including correction of presbyopia and aphakia, direct ophthalmoscopy and conjunctival smear examination and Cover test.

3. diagnose and treat common problems affecting the eye;

4. interpret ophthalmic signs in relation to common systemic disorders;

5. assist/observe therapeutic procedures such as subconjunctival injection, Corneal/Conjunctival foreign body removal, Carbolic cautery for corneal ulcers, Nasolacrimal duct syringing and tarsorraphy;

6. provide first aid in major ophthalmic emergencies;

7. assist to organise community surveys for visual check up;

8. assist to organise primary eye care service through primary health centres;

9. use effective means of communication with the public and individual to motivate for surgery in cataract and for eye donation;

10. establish rapport with his seniors, colleagues and paramedical workers, so as to effectively function as a member of the eye care team.

c. **INTEGRATION**

The undergraduate training in Ophthalmology will provide an integrated approach towards other disciplines especially neurosciences, Otorhino-laryngology, General Surgery and Medicine.

10.5. OBSTETRICS AND GYNAECOLOGY

Obstetrics and Gynaecology to include family welfare and family planning.

i) GOAL:

The broad goal of the teaching of undergraduate students in Obstetrics and Gynaecology is that he/she should acquire understanding of anatomy, physiology and pathophysiology of the reproductive system and gain the ability to optimally manage common conditions affecting it.

ii) OBJECTIVES

a. KNOWLEDGE

At the end of the course, the student should be able to:

1. Outline the anatomy, physiology and pathophysiology of the reproductive system and the common conditions affecting it.

2. detect normal pregnancy, labour puerperium and manage the problems he/she is likely to encounter therein.

3. list the leading causes of maternal and perinatal morbidity and mortality.

4. understand the principles of contraception and various techniques employed, methods of medical termination of pregnancy, sterilisation and their complications.

5. identify the use, abuse and side effects of drugs in pregnancy, pre-menopausal and post-menopausal periods.

6. describe the national programme of maternal and child health and family welfare and their implementation at various levels.

7. identify common gynaecological diseases and describe principles of their management.

8. state the indications, techniques and complications of surgeries like Caesarian section, laparotomy, abdominal and vaginal hysterectomy, Fothergill's operation and vacuum aspiration for M.T.P.

b. **SKILLS**

At the end of the course, the student should be able to:

1. examine a pregnant woman; recognise high risk pregnancies and make appropriate referrals.

2. conduct a normal delivery, recognise complications and provide postnatal care.

3. resuscitate the newborn and recognise congenital anomalies.

4. advise a couple on the use of various available contraceptive devices and assist in insertion in and removal of intra-uterine contraceptive devices.

5. perform pelvic examination, diagnose and manage common gynaecological problems including early detection of genital malignancies.

6. make a vaginal cytological smear, perform a post coital test and wet vaginal smear examination for Trichomonas vaginalis, moniliasis and gram stain for gonorrhoea.

7. interpretation of data of investigations like biochemical, histopathological, radiological, ultrasound etc.

c. **INTEGRATION**:

The student should be able to integrate clinical skills with other disciplines and bring about coordinations of family welfare programmes for the national goal of population control.

d. GENERAL GUIDELINES FOR TRAINING:

1. attendance of a maternity hospital or the maternity wards of a general hospital including (i) antenatal care (ii) the management of the puerperium and (iii) a minimum period of 5 months in-patient and out-patient training including family planning.

2. of this period of clinical instruction, not less than one month shall be spent as a resident pupil in a maternity ward of a general hospital.

3. during this period, the student shall conduct at least 10 cases of labour under adequate supervision and assist in 10 other cases.

4. a certificate showing the number of cases of labour attended by the student in the maternity hospital and/or patient homes respectively, should be signed by a responsible medical officer on the staff of the hospital and should state:

(a) that the student has been present during the course of labour and personally conducted each case, making the necessary abdominal and other examinations under the supervision of the certifying officer who should describe his official position.

(b) that satisfactory written histories of the cases conducted including wherever possible antenatal and postnatal observations, were presented by the student and initialed by the supervising officer.

5. FAMILY PLANNING:

Training in Family Planning should be emphasized in all the three phases and during internship as per guideline provided in Appendix A.

6. COMMUNITY MEDICINE

The teaching and training of community medicine will continue during the first two semesters of phase III (clinical Phase). The goals, objectives and skills to be acquired by the student has already been outlived in Phase II(Para Clinical Phase).

The following sub-clause 7 has been inserted vide notification dated 20.10.2008 .

7. EMERGENCY MEDICINE:

This must be a general department. Till such time a full-fledged department is created this may be under the control of the Department of Anaesthesia.

CHAPTER – IV

12. Examination Regulations

Essentialities for qualifying to appear in professional examinations.

The performance in essential components of training are to be assessed, based on:

(1) **ATTENDANCE**

75% of attendance in a subject for appearing in the examination is compulsory provided he/she has 80% attendance in non lecture teaching. i.e. seminars, group discussions, tutorials, demonstrations, practicals, Hospital (Tertiary, Secondary, Primary) postings and bed side clinics, etc.

The above Section 12(1) has been substituted in terms of notification published on 16.10.2003 in the Gazette of India .

"(I) ATTENDANCE: 75% attendance in a subject for appearing in the examination is compulsory inclusive of attendance in non-lecture teaching i.e. seminars, group discussions, tutorials, demonstrations, practicals, hospital (Teritary Secondary, Primary) posting and bed side clinics etc."

(2) **Internal Assessment :**

(i) It shall be based on day to day assessment (see note), evaluation of student assignment, preparation for seminar, clinical case presentation etc.:

(ii) Regular periodical examinations shall be conducted throughout the course. The questions of number of examinations is left to the institution:

(iii) Day to day records should be given importance during internal assessment :

(iv) Weightage for the internal assessment shall be 20% of the total marks in each subject :

(v) Student must secure at least 50% marks of the total marks fixed for internal assessment in a particular subject in order to be eligible to appear in final university examination of that subject.

The above sub-section 12(2)(5) has been substituted in terms of the notification published on 16.10.2003 in the Gazette of India.

> ***"(v) student must secure atleast 35% marks of the total marks fixed for internal assessment in a particular subject in order to be eligible to appear in final university examination of that subject."***

Note

Internal assessment shall relate to different ways in which students participation in learning participation in learning process during semesters in evaluated.

Some examples are as follows:

(i) Preparation of subject for students seminar.
(ii) Preparation of a clinical case for discussion.
(iii) Clinical case study/problem solving exercise.
(iv) Participation in Project for health care in the community (planning stage to evaluation).
(v) Proficiency in carrying out a practical or a skill in small research project.
(vi) Multiple choice questions (MCQ) test after completion of a system/teaching.

Each item tested shall be objectively assessed and recorded. Some of the items can be assigned as Home work/Vacation work.

(3) **UNIVERSITY EXAMINATIONS :**

Theory papers will be prepared by the examiners as prescribed. Nature of questions will be short answer type/objective type and marks for each part indicated separately.

Practicals/clinicals will be conducted in the laboratories or hospital wards. Objective will be assess proficiency in skills, conduct of experiment, interpretation of data and logical conclusion. Clinical cases should preferably include common diseases not esoteric syndromes or rare disorders. Emphasis should be on candidate's capability in eliciting physical signs and their interpretation.

Viva/oral includes evaluation of management approach and handling of emergencies. Candidate's skill in interpretation of common investigative data, x-rays, identification of specimens, ECG,etc. also is to be evaluated.

The examinations are to be designed with a view to ascertainwhether the candidate has acquired the necessary for knowledge, minimum skills alongwith clear concepts of the fundamentals which are necessary for him to carry out his professional day to day work competently. Evaluation will be carried out on an objective basis.

Question papers should preferably be of short structure/objective type.

Clinical cases/practicals shall take into account common diseases which the student is likely to come in contact in practice. Rare cases/obscure syndromes, long cases of neurology shall not be put for final examination.

During evaluation (both Internal and External) it shall be ascertained if the candidate has acquired the skills as detailed in Appendex-B.

There shall be one main examination in a year and a supplementary to be held not later than 6 months after the publication of its results. Universities Examinations shall beheld as under:-

First Professional:-

In the second Semester of Phase 1 training, in the subjects of Anatomy, Physiology and Bio-Chemistry.

Second Professional:-

In the Fifth Semester of Phase II training, in the subjects of Pathology, Microbiology, Pharmacy and Forensic Medicine.

Third Profesional :-

Part 1- in the Seventh Semester of Phase III, in the subjects of Ophthamology, Oto-rhyno-laryngology and Community Medicine.

Third Professional :-

Part II-(Final Professional) – At the end of Phase III training in the subjects of Medicine, Surgery, Obstetrics & Gynecology and Pediatrics.

Note :

Results of all university examinations shall be declared before the start of teaching for next semester.

Para 1 and 2 of the above clause 12(3) beginning with the words "Theory papers will be" and ending with words "their interpretation" have been substituted in terms of notification published on 20.10.2008 in Gazette of India .

Theory papers will be prepared by the examiners as prescribed. Nature of questions will be short answer type/objective type and marks for each part indicated separately. Question papers should preferably be of short structure/objective type.

Practicals/clinicals will be conducted in the laboratories or hospital wards. The objective will be to assess proficiency in skills, conduct of experiment, interpretation of data and logical conclusion. Clinical cases should preferably include common diseases and not esoteric syndromes or rare disorders. Emphasis should be on candidate's capability in eliciting physical signs and their interpretation. Clinical cases/practicals shall take into account common diseases which the student is likely to come in contact in practice. Rare cases/obscure syndromes, long cases of neurology shall not be put for final examination."

Note:

a) Passing in Ist Professional is compulsory before proceeding to Phase II training.

b) A student who fails in the IInd professional examination, should not be allowed to appear IIIrd Professional Part I examination unless he passes all subjects of IInd Professional examination.

c) Passing in IIIrd Professional (Part-1) is compulsory for being eligible for IIIrd Professional (Part II) examination

(4) **DISTRIBUTION OF MARKS TO VARIOUS DISCIPLINES :**

(A) First Professional examination:(Pre-clinical Subjects):-

(a) Anatomy:
Theory-Two papers of 50 marks each
(One applied question of 10 marks in each paper) 100 marks.

Oral(Viva)	20 marks
Practical	40 marks

Internal Assessment
(Theory-20; Practical-20) 40 marks
Total 200 marks

(b) Physiology including Biophysics
Theory-Two papers of 50 marks each
(One applied question of 10 marks in each paper) 100 marks
Oral (Viva) 20 marks
Practical 40 marks
Internal Assessment
(Theory-20; Practical-20) 40 marks
Total 200 marks

(c) Biochemistry :
Theory-Two papers of 50 marks each
(One applied question of 10 marks in each paper) 100 marks

Oral (Viva) 20 marks
Practical 40 marks
Internal Assessment
(Theory-20; Practical-20) 40 marks
Total 200 marks

Pass: In each of the subjects, a candidate must obtain 50% in aggregate with a minimum of 50% in Theory including orals and minimum of 50% in Practicals.

(B) SECOND PROFESSIONAL EXAMINATION;

(Para-clinical subjects)
:
(a) Pathology :
Theory-Two papers of 40 marks each
(One applied question of 10 marks in each paper) 80 marks
Oral (Viva) 15 marks
Practical
Internal assessment
(Theory-15; Practical-15) 30 marks
Total 150 marks

(b) Microbiology :
Thoery-Two papers of 40 marks each
(One applied question of 10 marks in each paper) 80 marks
Oral (Viva) 15 marks
Practical
Internal assessment

(Theory-15; Practical-15)	30 marks
Total	150 marks

(c) Pharmacology

Thoery-Two papers of 40 marks each	
Containing one question on clinical therapeuics	80 marks
Oral (Viva)	15 marks
Practical	25 marks
Internal assessment	
(Theory-15; Practical-15)	30 marks
Total	150 marks

(d) Forensic Medicine

Theory-one papaers	40 marks
Oral (Viva)	10 marks
Practical/Clinicals	30 marks
Internal assessment	
(Theory-10; Practical-10)	20 marks
Total	100 marks

Pass: In each of the subjects, a candidate must obtain 50 % in aggregate with a minimum of 50% in Theory including oral and minimum of 50% in Practicals/clinicals.

(d) THIRD PROFESSIONAL

(i) PART 1
(Clinical subjects)
Part 1: To be conducted during end period of seventh semester.

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(a) Ophthamology:

Theory : One paper	40 marks
(should contain one question on pre-clinical and para-clinical aspects, of 10 marks)	
Oral (Viva)	10 marks
Clinical	30 marks
Internal assessment	20 marks
(Theory-10; Practical-10)	
Total	100 marks

(b) **Oto-Rhino-Laryngology :**

Theory:One paper	40 marks
(should contain one question on pre-clinical and	

para-clinical aspects, of 10 marks)

Oral(Viva)	10 marks
Clinical	30 marks
Internal assessment	20 marks
(Theory –10 Practical-10)	
Total	100 marks

(c) **Community Medicine including Humanities:**

Theory : Two papers of 60 marks each	120 marks

(includes problem solving, applied aspects of management at primary level including essential drugs, occupational (agro based) diseases, rehabilitation and social aspects of community).

Oral (Viva)	10 marks
Practical/Project evaluation	30 marks
Internal assessment	40 marks
(Theory -20; Practical-20)	
Total	200 marks

Pass: In each of the subjects a candidate must obtain 50% in aggregate with a minimum of 50% in Theory including orals and minimum of 50% in practicals/clinicals.

PART-II

Each paper shall have two sections. Questions requiring essay type answers may be avoided.

(a) Medicine :

Theory- Two papers of 60 marks each	120 marks
Paper 1- General Medicine	
Paper II- General Medicine (including Psychiatry, Dermatology and S.T.D.)	
(Shall contain one question on basic sciences and allied subjects)	
Oral (Viva) Interpretation of X-ray ECG, etc. 20 marks	
Clinical (Bed side)	100 marks
Internal assessment	60 marks
(Theory-30; Practical-30)	
Total	300 marks

(b) Surgery:

Theory-Two papers of 60 marks each	120 marks
Paper-1-General Surgery (Section 1)	
Orthopaedics (Section 2)	

PAPER II-General Surgery including

Anaesthesiology, Dental diseases and Radiology.

(shall contain one question on basic sciences and allied subjects)

Oral (Viva) Interpretation of Investigative data	20 marks
Clinical (Bed Side)	100 marks
Internal assessment	60 marks
(Theory-30; Practical-30)	60 marks
Total	300 marks

Paper 1 of Surgery shall have one section in Orthopaedics. The questions on Orthopaedic Surgery be set and assessed by examiners who are teachers in the Orthopaedic surgery.

(c) **Obstetrics and Gynaecology**

Theory Two papers of 40 marks each	80 marks
Paper I- Obstetrics including social obstetrics.	
Paper II – Gynaecology, Family Welfare and Demography	
(Shall contain one question on basic sciences and allied subjects)	
Oral (Viva) including record of delivery cases(20+10)	30 marks
Clinical	60 marks
Internal assessment	
(Theory-30; Practical-30)	
Total	200 marks

(d) Pediatrics : (Including Neonstology)

Theory : One paper	40 marks
(Shall contain one question on basic sciences and allied subjects)	
Oral (Viva)	10 marks
Clinical	30 marks
Internal assessment	20 marks
(Theory-10; Practical-10)	
Total	100 marks

Pass : In each of the subjects a candidate must obtain 50% in aggregate with a minimum of 50% in Theory including orals and minimum of 50% in Practicals/clinicals.

The marks mentioned against "Clinical" i.e. 60 marks have been substituted as "50 marks" and "internal assessment 60 (Theory-30; Practical-30)" words have been substituted by "Internal assessment 40 (Theory-20; Practical-20)"in terms of notification published on 20.10.2008 in Gazette of India .

13 **APPOINTMENT OF EXAMINERS:**

(1) No person shall be appointed as an examiner in any of the subjects of the Professional examination leading to and including the final Professional examinations for the award of the MBBS degree unless he has taken atleast five years previously, a doctorate degree of a recognized university or an equivalent qualification in the particular subject as per recommendation of the Council on teachers' eligibility qualifications and has had at least five years of total teaching experience in the subject concerned in a college affiliated to a recognized university at a faculty position.

(2) There shall be at least four examiners for 100 students, out of whom not less than 50% must be external examiners. Of the four examiners, the senior most internal examiner will act as the Chairman and co-ordinator of the whole examination programme so that uniformity in the matter of assessment of candidates is maintained. Where candidates appearing are more than 100, one additional examiner, for every additional 50 or part thereof candidates appearing, be appointed.

(3) Non medical scientists engaged in the teaching of medical students as whole time teachers, may be appointed examiners in their concerned subjects provided they possess requisite doctorate qualifications and five year teaching experience of medical students after obtaining their postgraduate qualifications. Provided further that the 50% of the examiners (Internal & External) are from the medical qualification stream

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(4) External examiners shall not be from the same university and preferably be from outside the state.

(5) The internal examiner in a subject shall not accept external examinership for a college from which external examiner is appointed in his subject.

(6) A university having more than one college shall have separate sets of examiners for each college, with internal examiners from the concerned college.

(7) External examiners shall rotate at an interval of 2 years.

(8) There shall be a Chairman of the Board of paper-setters who shall be an internal examiner and shall moderate the questions.

(9) Except Head of the department of subject concerned in a college/institution, all other with the rank of reader or equivalent and above with requisite qualifications and experience shall be appointed internal examiners by rotation in their subjects; provided that where there are no posts of readers, then an Assistant Professor of 5 years standing as Assistant Professor may be considered for appointment as examiner.

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(10) The grace marks up to a maximum of five marks may be awarded at the discretion of the University to a student who has failed only in one subject but has passed in all other subjects.

CHAPTER - V

14. INTERNSHIP

(1) General

Internship is a phase of training wherein a graduate is expected to conduct actual practice of medical and health care and acquire skills under supervision so that he/she may become capable of functioning independently.

The word "conduct" has been substituted by the words "learn methods/modalities for" in terms of notification published on 20.10.2008 in Gazette of India.

The above clause 14(1) has been substituted in terms of notification published on 15.12.2008 in the Gazette of India.

In order to make trained work force available, it may be considered as a phase of training wherein the graduate is expected to conduct actual practice under the supervision of a trained doctor. The learning methods and modalities have to be done during the MBBS course itself with larger number of hands on session, practice on simulators including zoes models.

(2) SPECIFICE OBJECTIVES

At the end of the internship training, the student shall be able to:

i. diagnose clinical common disease conditions encountered in practice and make timely decision for referral to higher level;

ii. use discreetly the essential drugs, infusions, blood or its substitutes and laboratory services.

iii. Manage all type of emergencies-medical, surgical obstetric, neonatal and paediatric, by rendering first level care;

iv. Demonstrate skills in monitoring of the National Health Programme and schemes, oriented to provide preventive and promotive health care services to the community;

v. Develop leadership qualities to function effectively as a leader of the health team organised to deliver the health and family welfare service in existing socio-ecomic, political and cultural environment;

vi. Render services to chronically sick and disabled (both physical and mental) and to communicate effectively with patient and the community.

(3) Time allocation to each discipline is approximate and shall be guided more specifically by the actual experience obtained. Thus a student serving in a district or taluk hospital emergency room may well accumulate skill in surgery, orthopaedics, medicine, obstetrics and Gynaecology and Paediatrics during even a single night on duty. Responsible authorities from the medical college shall adjust the intern experience to maximize intern's opportunities to practice skills in patient care in rough approximation of the time allocation suggested.

(4) INTERNSHIP – TIME DISTRIBUTION

Compulsory

Community Medicine	3 months
Medicine	2 months
Surgery including Orthopaedics	2 months
Obst./Gynae. Including Family Welfare Planning	2 months
Paediatric	15 days
Ophthalmology	15 days
Otorhinolaryngology	15 days
Casualty	15 days
Elective Postings	One month

Elective subjects-

Elective posting will include two of the following for 15 days in each subject.

i) Dermatology and Sexually Transmitted Diseases,
ii) Psychiatry,
iii) Tuberculosis and Respiratory Diseases,
iv) Anaesthesia,
v) Radio-diagnosis,
vi) Physical Medicine and Rehabilitation,
vii) Forensic Medicine and Toxicology,
viii) Blood bank and Transfusion Department

The above clause 14(4) has been substituted in terms of notification published on 20.10.2008 in the Gazette of India.

COMPULSORY

Community Medicine	***2 months***
Medicine including 15 days of Psychiatry	***2 months***
Surgery including 15 days Anaesthesia	***2 months***
Obst./Gynae. including Family Welfare Planning	***2 months***
Paediatrics	***1 month***
Orthopaedics including PMR	***1 month***
ENT	***15 days***
Ophthalmology	***15 days***
Casualty	***15 days***
Elective Posting (1x15 days)	***15 days***

Subjects for Elective posting will be as follows:

i) Dermatology and Sexually Transmitted Diseases.

ii) Tuberculosis and Respiratory Diseases.

iii) Radio-Diagnosis

iv) Forensic Medicine

v) ***Blood Bank***

vi) ***Psychiatry***

Note: Structure internship with college assessment at the end of the internship.

(5) OTHER DETAILS:

i) All parts of the internship shall be done as far as possible in institutions of India. In case of any difficulties, the matter may be referred to the Medical Council of India to be considered on individual merit.

ii) Every candidate will be required after passing the final MBBS examination to undergo compulsory rotational internship to the satisfaction of the College authorities and University concerned for a period of 12 months so as to be eligible for the award of the degree of Bachelor of Medicine and Bachelor of Surgery (MBBS) and full registration.

iii) The University shall issue a provisional MBBS pass certificate on passing the final examination.

iv) The State Medical Council will grant provisional registration to the candidate on production of the provisional MBBS pass certificate. The provisional registration will be for a period of one year. In the event of the shortage or unsatisfactory work, the period of provisional registration and the compulsory rotating internship may be suitably extended by the appropriate authorities.

v) The intern shall be entrusted with clinical responsibilities under direct supervision of senior medical officer. They shall not be working independently.

vi) Interns will not issue a medical certificate or a death certificate or a medicolegal document under their signature.

vii) In recognition of the importance of hands-on experience, full responsibility for patient care and skill acquisition, internship should be increasingly scheduled to utilize clinical facilities available in District Hospital, Taluka Hospital, Community Health Centre and Primary Health Centre, in addition to Teaching Hospital. A critical element of internship will be the acquisition of specific experiences and skill as listed in major areas:

Provided that where an intern is posted to District/Sub Divisional Hospital for training, there shall be a committee consisting of representatives of the college/university, the State Government and the District administration, who shall regulate the training of such trainee.

Provided further that for such trainee a certificate of satisfactory completion of training shall be obtained from the relevant administrative authorities which shall be countersigned by the Principal/Dean of College;

viii) Adjustment to enable a candidate to obtain training in elective clinical subjects may be made.

ix) Each medical college shall establish links with one entire district extending out-reach activities. Similarly, Re-orientation of Medical Education (ROME) scheme may be suitably modified to assure teaching activities at each level of District health system which will be coordinated by Dean of the medical college;

x) Out of one year, 6 months shall be devoted to learning tertiary care being rendered in teaching hospital/district hospital suitably staffed with well qualified staff, 3 months of secondary care in a small District or Taluka Hospital/Community Health Centre and 3 months in Primary Health care out of which 2 months should be in Primary Health Programme at the Community level. One month of primary care training may be in the form of preceptorship with a practicing family physician or voluntary agency or other primary health care provider.

xi) One year's approved service in the Armed Forces Medical Services, after passing the final MBBS examination shall be considered as equivalent to the pre-registration training detailed above; such training shall, as far as possible, be at the Base/General Hospital.

(6) **ASSESSMENT OF INTERNSHIP**:

i) The intern shall maintain a record of work which is to be verified and certified by the medical officer under whom he works. Apart from scrutiny of the record of work, assessment and evaluation of training shall be undertaken by an objective approach using situation tests in knowledge, skills and attitude during and at the end of the training. Based on the record of work and date of evaluation, the Dean/Principal shall issue certificate of satisfactory comnpletion of training, following which the University shall award the MBBS degree or declare him eligible for it.

ii) Satisfactory completion shall be determined on the basis of the following:-

(1) Proficiency of knowledge required for each case

SCORE 0-5

(2) The competency in skills expected to manage each case:

a) Competency for performance of self performance,
b) of having assisted in procedures,
c) of having observed.

SCORE 0-5

(3) Responsibility, punctuality, work up of case, involvement in treatment, follow-up reports.

SCORE 0-5

(4) Capacity to work in a team (Behaviour with colleagues, nursing staff and relationship with paramedicals).

SCORE 0-5

(5) Initiative, participation in discussions, research aptitude.

SCORE 0-5

Poor	Fair	below average	average	above average	excellent
0	1	2	3	4	5

A Score of less than 3 in any of above items will represent unsatisfactory completion of internship.

(7) Full registration shall only be given by the State Medical Council/Medical Council of India on the award of the MBBS degree by the university or it declaration that the candidate is eligible for it.

(8) Some guidelines in the implementation of the training programme are given below.

(9) I**NTERNSHIP – DISCIPLINE RELATED:**

(i) Community Medicine

Interns shall acquire skills to deal effectively with an individual and the community in the context of primary health care. This is to be achieved by hands on experience in the district hospital and primary health Centre. The details are as under: -

(I) Community Health Centre/District Hospital/Attachment to General Practitioner**:**

(1) During this period of internship an intern must acquire

(a) clinical competence for diagnosis of common ailments, use of bed side investigation and primary care techniques;

(b) gain information on 'Essential drugs' and their usage;

(c) recognise medical emergencies, resuscitate and institute initial treatment and refer to suitable institution.

(2) Undergo specific Government of India/Ministry of Health and Family Welfare approved training using Government of India prescribed training manual for Medical Officers in all National Health Programmes (e.g. child survival and safe motherhood-EPI, CDD, ARI, FP, ANC, safe delivery, Tuberculosis, Leprosy and others as recommended by Ministry of Health and Family Welfare:-

(a) gain full expertise in immunization against infectious disease;
(b) participate in programmes in prevention and control of locally prevalent endemic diseases including nutritional disorders;
(c) learn skills first hand in family welfare planning procedures;
(d) learn the management of National Health Programmes;

(3) Be capable of conducting a survey and employ its findings as a measure towards arriving at a community diagnosis.

(4) (a) conduct programmes on health education,
(b) gain capabilities to use Audiovisual aids,
(c) acquire capability of utilization of scientific information for promotion of community health
.

(5) Be capable of establishing linkages with other agencies as water supply, food distribution and other environmental/social agencies.

(6) Acquire quality of being professional with dedication, resourcefulness and leadership.

(7) Acquire managerial skills, delegation of duties to paramedical staff and other health professionals.

(II) TALUQA HOSPITAL

Besides clinical skill, in evaluation of patient in the environment and initiation of primary care, an Intern shall: -

(1) effective participate with other members of the health team with qualities of leadership;
(2) make a community diagnosis in specific situations such as epidemics and institute relevant control measures for communicable diseases;
(3) develop capability for analysis of hospital based morbidity and mortality statistics.
(4) Use essential drugs in the community with the awareness of availability, cost and side effects;
(5) Provide health education to an individual/community on :
   a) tuberculosis;
   b) small family, spacing, use of appropriate contraceptives;
   c) applied nutrition and care of mothers and children;
   d) immunization;
   e) participation in school health programme.

(III) PRIMARY HEALTH CENTRE

(1) Initiate or participate in family composite health care (birth to death), Inventory of events;
(2) Participation in all of the modules on field practice for community health e.g. safe motherhood, nutrition surveillance and rehabilitation, diarrhea disorders etc.
(3) Acquire competence in diagnosis and management of common ailments e.g. malaria, tuberculosis, enteric fever, congestive heart failure, hepatitis, meningitis acute renal failure etc.;
(4) Acquire proficiency for Family Welfare Programmes (ante natal care, normal delivery, contraception care etc.)

The following has been added in terms of notification published on 15.12.2008 in the Gazette of India.

(5) A village attachment of atleast one week to understand issues of community health along with exposure to village health centres, ASHA Sub Centres should be added.

(ii) GENERAL MEDICINE

(I) Interns shall acquire following training during their term.

(1) acquire competence for clinical diagnosis based on history physical examination and relevant laboratory investigation and institute appropriate line of management;

(2) this would include diseases common in tropics (parasitic, bacterial or viral infections, nutritional disorders, including dehydration and electrolyte disturbances) and system illnesses

.

(II) The intern shall have assisted as a care team in intensive care of cardiac, respirator, hepatic, neurological and metabolic emergencies.

(III) The intern shall be able to conduct the following laboratory investigations:

(a) Blood: (Routine haematology smear and blood groups);
(b) Urine: (Routine chemical and microscopic);
(c) Stool: (for ova/cyst and occult blood);
(d) Sputum and throat swab for gram stain or acid fast stain and
(e) Cerebro Spinal Fluid (CSF) for smear.

(IV) Conduct following diagnostic procedures:

(a) Urethral catheterisation;
Proctoscopy;
Ophthalmoscopy/Otoscopy;
Indirect laryngoscopy;

(b) therapeutic procedures;
Insertion of Ryles Tube;
Pleural, ascetic tap, Cerebro Spinal Fluid (CSF) tap, installing or air way tube, Oxygen administration etc.

(V) Biopsy Procedures:

Liver, Kidney, Skin, Nerve, Lymph node, and muscle biopsy, Bone marrow aspiration, Biopsy of Malignant lesions on surface, Nasal/nerve/skin smear for leprosy.

(VI) (a) Familiarity with usage of life saving procedures:
including use of aspirator, respirator and defibrillator,
(b) Competence in interpretation of different monitoring devices such as cardiac monitor, blood gas analysis etc.

(VII) Participate as a team member in total health care of an individual including appropriate follow-up and social rehabilitation.

(VIII) Other competencies as indicated in general objectives.

(iii) PAEDIATRICS:

The details of the skills that an intern shall acquire during his/her tenure in the department of Paediatrics are as follows:

The intern shall be able to:

(1) diagnose and manage common childhood disorders including neonatal disorders and acute emergencies(enquiry from parents of sick children), examining sick child making a record of information;

(2) carry out activities related to patient care such as laboratory work, investigative procedures and use of special equipments. The details are given as under:-

(a) diagnostic techniques: blood (including from femoral vein and umbilical cord), obscess, cerebrospinal fluid, urine, pleura and peritoneum and common tissue biopsy techniques;
(b) techniques related to patient care: immunization, perfusion techniques, feeding procedures, tuberculin testing & breast feeding counselling;
(c) use of equipment: vital monitoring, temperature monitoring, resuscitation at birth and care of children receiving intensive care;

(3) screening of newborn babies and those with objective risk factors for any anomalies and steps for prevention in future;
(4) plan in collaboration with parents and individual, collective surveillance of growth and development of new born babies, infants and children so that he/she is able to:

(a) recognise growth abnormalities;
(b) recognise anomalies of psychomotor development;
(c) detect congenital abnormalities;

(5) assess nutritional and dietary status of infants and children and organise prevention, detection and follow up of deficiency disorders both at individual and community level such as:

(a) protein-energy malnutrition
(b) deficiencies of vitamins especially A, B, C and D;
(c) Iron deficiency;

(6) institute early management of common childhood disorders with special reference to Paediatrics dosage and oral rehydration therapy.

(7) Participate actively in public health programme oriented towards children in the community.

(iv) GENERAL SURGERY

An intern is expected to acquire following skills during his/her posting:

(A) Diagnose with reasonable accuracy all surgical illnesses including emergencies

(B) (a) resuscitate a critically injured patient and a severe burns patient;
(b) control surface bleeding and manage open wound;

(C) (a) monitor patients of head, spine, chest abdominal and pelvic injury;
(b) institute first-line management of acute abdomen;

(D) (a) perform venesection;
(b)perform tracheostomy and endotracheal intubation;
(c) catheterise patients with acute retention or perform trocar cystostomy,
(d) drain superficial abscesses,
(e) suturing of wound,
(f) perform circumcision,
(g) biopsy of surface tumours,
(h) Perform vasectomy

.

(v) CASUALTY:

The intern after training in Casualty must be able to:

(1) identify acute emergencies in various disciplines of medical practice;
(2) manage acute anaphylatic shock;
(3) manage peripheral-vascular failure and shock;
(4) manage acute pulmonary oedema and Left Ventricular failure (LVF);
(5) undertake emergency management of drowning poisonings and seizures;

(6) undertake emergency management of bronchial asthma and status asthematicus;
(7) undertake emergency management of hyperpyrexia;
(8) undertake emergency management of comatose patients regarding airways positioning, prevention of aspiration and injuries;
(9) assess and administer emergency management of burns;
(10) assess and do emergency management of various trauma victims;
(11) identify medicolegal cases and learn filling up forms as well as complete other medicolegal formalities in cases of injury, poisoning, sexual offenses, intoxication and other unnatural conditions.

(vi) OBSTETRICS AND GYNAECOLOGY :

Technical skills that interns are expected to learn:

(1) diagnosis of early pregnancy and provision of ante-natal care;

(2) diagnosis of pathology of pregnancy related to

(a) abortions;
(b) ectopic pregnancy;
(c) tumours complicating pregnancy;
(d) acute abdomen in early pregnancy;
(e) hyperemesis gravidarum;

(3) detection of high risk pregnancy cases and suitable advise e.g. PIH, hydramanios, antepartum haemorrhage, multiple pregnancies, abnormal presentations and intra-uterine growth retardation;

(4) antenatal pelvic assessment and detection of cephalopelvic disproportion;

(5) induction of labour and amniotomy under supervision;

(6) management of normal labour, detection of abnormalities, post-partum hemorrhage and repair of perennial tears;

(7) assist in forceps delivery;

(8) assist in caesarean section and postoperative care thereof;

(9) detection and management of abnormalities of lactation;

(10) perform non-stress test during pregnancy;

(11) per speculum, per vaginum and per rectal examination for detection of common congenital, inflammatory, neoplastic and traumatic conditions of vulva, vagina, uterus and ovaries;

(12) medicolegal examination in Gynecology and obstetrics.

(13) To perform the following procedures:-
(a) dilation and curettage and fractional curettage;
(b) endometrial biopsy;
(c) endometrial aspiration;
(d) pap smear collection;
(e) Intra Uterine Contraceptive Device (IUCD) insertion;
(f) Minilap ligation;
(g) Urethral catheterisation;
(h) Suture removal in postoperative cases;
(i) Cervical punch biopsy;

(14) to assist in major abdominal and vaginal surgery cases in Obstetrics and Gynaecology.

(15) to assist in follow-up postoperative cases of obstetrics and gynaecology such as:
(a) Colposcopy;
(b) Second trimester Medical Termination of Pregnancy (MTP) procedures e.g. Emcredyl Prostaglandin instillations;

(16) To evaluate and prescribe oral contraceptive.

(vii) OTO RHINO LARYNGOLOGY (ENT)

(1) Interns shall acquire ability for a comprehensive diagnosis of common Ear, Nose and Throat (ENT) diseases including the emergencies and malignant neoplasma of the head and neck;

(2) he/she shall acquire skills in the use of head mirror, otoscope and indirect laryngoscopy and first line of management of common Ear Nose and Throat (ENT) problems;

(3) he/she shall be able to carry out minor surgical procedures such as:
(a) earsyringing antrum puncture and packing of the nose for epistaxis,
(b) nosal douching and packing of the external canal,
(c) Remove the foreign bodies from the nose and ear

(d) Observed or assisted in various endoscopiec procedures and trachesotomy;

(4) an item shall have participated as a team member in the community diagnosis e.g. Chronic Suppurative Otitis Media (CSOM) and be aware of national programme on prevention of deafness

,

(5) he/she shall possess knowledge of various ENT rehabilitative programmes.

(viii) OPHTHALMOLOGY

An intern shall acquire following skills: -

(1) he/she shall be able to diagnose and manage common ophthalmological conditions such as:-

Trauma, Acute conjunctivitis, allergic conjunctivitis, xerosis, entropion, corneal ulcer, iridocyclitis, myopia, hypermetropia, catarct, glaucoma, ocular injury and sudden loss of vision;

(2) he shall be able to carry out assessment of refractive errors and advise its correction;

(3) he shall be able to diagnose ocular changes in common systemic disorders;

(4) he/she shall be able to perform investigative procedures such as:- Tonometry, syringing, direct ophthalmoscopy, subjective refraction and fluorescein staining of cornea.

(5) he/she shall have carried out or assisted the following procedures:
- (1) Subconjunctival injection;
- (2) Ocular bandaging;
- (3) Removal of concretions;
- (4) Epilation and electroysis;
- (5) Corneal foreign body removal;
- (6) Cauterization of corneal ulcers;
- (7) Chalazion removal;
- (8) Entropion correction;
- (9) Suturing conjunctival tears;
- (10) Lids repair
- (10) Glaucoma surgery (assisted);
- (11) Enucleation of eye in cadaver;

(6) he/she shall have full knowledge on available methods for rehabilitation of the blind.

(ix) ORTHOPAEDICS ;
GOAL:

The aim of teaching the undergraduate student in Orthopaedics and Rehabilitation is to impart such knowledge and shills that may enable him to diagnose and treat common ailments. He shall have ability to diagnose and suspect presence of fracture, dislocation, actual asteomyelitis, acute poliomyelitis and common congential deformities such as congentail talipes equinovarus (CTEV) and dislocation of hip (CDH).

(A) **THERAPEUTIC-** An intern must know:

(a) Splinting (plaster slab) for the purpose of emergency splintage, definitive splintage and post operative splintage and application of Thomas splint;
(b) Manual reduction of common fractures – phalangeal, metacarpal, metatarsal and Colles's fracture;
(c) Manual reduction of common dislocations – internphalangeal, metacarpophalangeal, elbow an shoulder dislocations;
(d) Plaster cast application for undisplaced fractures of arm, fore arm, leg and ankle;
(e) Emergency care of a multiple injury patient;
(f) Precautions about transport and bed care of spinal cord injury patients.

(B) Skill that an intern should be able to perform under supervision:

(1) Advise about prognosis of poliomyelitis, cerebral palsy, CTEV and CDH;
(2) Advise about rehabilitation of amputees and mutilating traumatic and leprosy deformities of hand;

(C) An intern must have observed or preferably assisted at the following operations:

(1) drainage for acute osteomyelitis;
(2) sequestrectomy in chronic osteomyelitis;
(3) application of external fixation;
(4) internal fixation of fractures of long bones.

(x) DERMATOLOGY AND SEXUALLY TRANSMITTED DISEASES

An intern must be able to: -

(1) conduct proper clinical examination; elicit and interpret physical findings, and diagnose common disorders and emergencies.
(2) Perform simple, routine investigative procedures for making bedside diagnosis, specially the examination of scraping for fungus, preparation

of slit smears and staining for AFB for leprosy patient and for STD cases;
(3) Take a skin biopsy for diagnostic purpose;
(4) Manage common diseases recognizing the need for referral for specialized care in case of inappropriateness of therapeutic response.

(xi) PSYCHIATRY :

An Intern must be able to:

(1) diagnose and manage common psychiatric disorders;
(2) identify and manage psychological reaction and psychiatric disorders in medical and surgical patients in clinical practice and community setting.

(xii) TUBERCULOSIS AND RESPIRATORY DISEASES :

An intern after training must be able to: -

(1) conducting proper clinical examination, elicit and interpret clinical findings and diagnose common respiratory disorders and emergencies;
(2) perform simple, routine investigative procedures required for making bed side diagnosis, specially sputum collection, examination for etiological organism like AFB, interpretation of chest X-rays and respiratory function tests;
(3) Interpret and manage various blood gases and pH abnormalities in various respiratory diseases;
(4) Manage common diseases recognizing need for referral for specialized care in case of inappropriateness of therapeutic response;
(5) Perform common procedures like laryngoscopy, pleural aspiration, respiratory physiotherapy, laryngeal intubation and pneumo-thoracic drainage aspiration.

(xiii) ANAESTHESIA :

After the internship in the department of Anesthesiology an intern shall acquire knowledge, skill and attitude to:

(1) perform pre-anaesthetic check up and prescribe pre-anaesthetic medications;
(2) perform venepuncture and set up intravenous drip;
(3) perform laryngoscopy and endotracheal intubation;
(4) perform lumbar puncture, spinal anaesthesia and simple nerve blocks;
(5) conduct simple general asaesthetic procedures under supervision;
(6) monitor patients during anaesthesia and post operative period;

(7) recognise and manage problems associated with emergency anaesthesia;
(8) maintain anaesthetic records;
(9) recognise and treat complication in post operative period;
(10) perform cardio-pulmonary brain resuscitation (C.P.B.R.) currectly, including recognition of cardiac arrest.

(xiv) RADIO-DIAGNOSIS:

An intern after training must be able to identify and diagnose:

(1) all aspects of 'Emergency Room' Radiology like –

(a) all acute abdominal conditions;
(b) all acute traumatic conditions with emphasis on head injuries;
(c) differentiation between Medical and surgical radiological emergencies;

(2) Basic hazards and precautions in Radio-diagnostic practices.

(xv) PHYSICAL MEDICINE AND REHABILITATION:

An intern is expected to acquire the following skills during his/her internship: -

(1) competence for clinical diagnosis based on details history an assessment of common disabling conditions like poliomyelitis, cerebral palsy, hemiplegia, paraplegia, amputations etc;
(2) participation as a team member in total rehabilitation including appropriate follow up of common disabling conditions;
(3) principles and procedures of fabrication and repair of artificial limbs and appliances;
(4) various therapeutic modalities;
(5) use of self help devices and splints and mobility aids;
(6) familiarity with accessibility problems and home making for disabled;
(7) ability to demonstrate simple exercise therapy in common conditions like prevention of deformity in polio, stump exercise in an amputee etc.;

(xvi) FORENSIC MEDICINE AND TOXICOLOGY

The intern is to be posted in the casualty department of the hospital while attached under Forensic Medicine Department with the following objectives:

(1) to identify medicolegal problem in a hospital and general practice;

(2) to identify and learn medicolegal responsibilities of a medical man in various hospital situations;
(3) to be able to diagnose and learn management of basic poisoning conditions in the community;
(4) to learn how to handle cases of sexual assault;
(5) to be able to prepare medico-legal reports in various medicolegal situations;
(6) to learn various medicolegal post-mortem procedures and formalities during its performance by police.

APPENDIX 'A'

Curriculum in 'Family Welfare' for the Bachelor of Medicine and Bachelor of Surgery (MBBS) Course.

The Curriculum may be considered under various pre and para clinical heads and the following details are worked out for each of the disciplines.

1. **Anatomy**

(1) Gross and microscopic anatomy of the male and female generative organs.
(2) The menstrual cycle.
(3) Spermatogenesis and Oogenesis
(4) Fertilization of the ovum.
(5) Tissue and organ changes in the mother in pregnancy.
(6) Embryology and Organogenesis.
(7) Principles of Genetics.
(8) Applied anatomy of mechanical methods of preventing conception.
a) in female- chemical contraceptive, pessaries, Intra-Uterine Contraceptive Device (IUCD), tubectomy etc.
b) in male – condom, vasectomy etc.

2. **Physiology**

(1) Physiology of reproduction.
(2) Endocrines and regulations of reproduction in the female
(3) Endocrines and physiology of reproduction in the male.
(4) Physiology and Endocrinology of pregnancy, parturition and lactation.
(5) Nutritional needs of mother and child during pregnancy and lactation.
(6) The safe period-rhythm method of contraceptions.
(7) Principles of use of oral contraceptive.

3. **Pharmacology**

(1) Mode of action and administration of:

(a) Chemical contraceptive
(b) Oral contraceptive

(2) Contra indication for administration of contraceptives.
(3) Toxic effects of contraceptives.

4. **Community Medicine**

(1) The need for family welfare Planning.

(2) Organization of Family Welfare Planning service.
(3) Health Education in relating to Family Welfare Planning.
(4) Nutrition.
(5) Psychological needs of the mother, the child and the family.
(6) Demography and vital Statistics.

5. **Obstetrics & Gynaecology**

(1) Contraceptive methods in male/female.
(a) Mechanical
A. Pessaries, Intra Uterine Contraceptive Device (IUCD), Condoms,
B. Tubectomy and vasectomy
(b) Chemical
(c) Oral
(d) Rhythm Method
(2) Demonstrations of use of Pessaries, IUCD, Condoms and technique of tubectomy
(3) Advice on family planning to be imparted to parents.

6. **Paediatrics:**

(1) Problems of child health in relation to large family.
(a) Organization of pediatric services.
(b) Nutritional problems of mother and child.
(c) Childhood diseases due to overcrowding.

7. **Surgery**

Technique of Vasectomy.

I. **Compulsory Internship**

Placement of a student for in-service training in a family welfare planning clinic for a period of at least one month.

II. Examination

It is necessary that questions on family welfare planning be introduced in the theory, practical and oral examination throughout the MBBS course.

The curriculum content has been indicated subjectwise. Hpwever, it would be more advantageous to the student for purpose of integrated learning and for understanding of the subject if family welfare planning instruction with the curriculum content indicated could be divided into two parts.

Part-I
Anatomy, Physiology, Biochemistry and Pharmacology

There shall be close integration in the teaching of these subjects. It is suggested that during the early para-clinical years, two to three weeks may be set apart for instruction in Family Welfare Planning relating to these subjects; so that the student gets an overall understanding of the principles and practice of "Family Planning" within the limited time available for covering all the subjects of the medical course. The method suggested would save time and repetition of essential facts.

Part-II

This includes the later para-clinical and clinical courses. The practical aspects of Family Welfare Planning methods should be emphasized. The program of instruction shall be supervised by the Department of Obstetrics and Gynaecology. The department of Community Medicine Internal Medicine, Psychiatry, Paediatics and Surgery must be closely associated in imparting instruction relating to the problems arising for want of family welfare planning and the advantages to society and the individual which will be gained by adopting the measures suggested.

Seminars:

The medical colleges shall organise occasional seminars in which staff from all departments and the in-service trainees shall participate.

APPENDIX-B

A comprehensive list of skills recommended as desirable for Bachelor of Medicine and Bachelor of Surgery (MBBS) Graduate:

1. **Clinical Evaluation:**

(a) To be able to take a proper and detailed history.
(b) To perform a complete and thorough physical examination and elicit clinical signs.
(c) To be able to properly use the stethoscope, Blood Pressure, Apparatus Auroscope, Thermometer, Nasal Speculum, Tongue Depressor, Weighing Scales, Vaginal Speculum etc.:
(d) To be able to perform internal examination-Per Rectum (PR), Per Vaginum (PV) etc.
(e) To arrive at a proper provisional clinical diagnosis.

II. Bed side Diagnostic Tests:

(a) To do and interpret Haemoglobin(HB), Total Count (TC), Erythrocytic Sedimentation Rate (ESR), Blood smear for parasites, Urine examiantion /albumin /sugar /ketones /microscopic.:
(b) Stool exam for ova and cysts;
(c) Gram, staining and Siehl-Nielsen staining for AFB;
(d) To do skin smear for lepra bacilli
(e) To do and examine a wet film vaginal smear for Trichomonas
(f) To do a skin scraping and Potassium Hydroxide (KOH) stain for fungus infections;
(g) To perform and read Montoux Test.

III. Ability to Carry Out Procedures.

(a) To conduct CPR (Cardiopulmonary resuscitation) and First aid in newborns, children and adults.
(b) To give Subcutaneous (SC) /Intramuscular (IM) /Intravenous (IV) injections and start Intravenous (IV) infusions.
(c) To pass a Nasogastric tube and give gastric leavage.
(d) To administer oxygen-by masic/eatheter
(e) To administer enema
(f) To pass a ruinary catheter- male and female
(g) To insert flatus tube
(h) To do pleural tap, Ascitic tap & lumbar puncture
(i) Insert intercostal tube to relieve tension pneumothorax
(j) To control external Haemorrhage.

IV **Anaesthetic Procedure**

(a) Administer local anaesthesia and nerve block
(b) Be able to secure airway potency, administer Oxygen by Ambu bag.

IV. Surgical Procedures

(a) To apply splints, bandages and Plaster of Paris (POP) slabs;
(b) To do incision and drainage of abscesses;
(c) To perform the management and suturing of superficial wounds;
(d) To carry on minor surgical procedures, e.g. excision of small cysts and nodules, circumcision, reduction of paraphimosis, debridement of wounds etc.
(e) To perform vasectomy;
(f) To manage anal fissures and give injection for piles.

VI **Mechanical Procedures**

(a) To perform thorough anternatal examination and identify high risk pregnancies.
(b) To conduct a normal delivery;
(c) To apply low forceps and perform and suture episiotomies;
(d) To insert and remove IUD's and to perform tubectomy

VII **Paediatrics**

(a) To assess new borns and recognise abnormalities and I.U. retardation
(b) To perform Immunization;
(c) To teach infant feeding to mothers;
(d) To monitor growth by the use of 'road to health chart' and to recognize development retardation;
(e) To assess dehydration and prepare and administer Oral Rehydration Therapy (ORT)
(f) To recognize ARI clinically;

VIII **ENT Procedures:**

(a) To be able to remove foreign bodies;
(b) To perform nasal packing for epistaxis;
(c) To perform trachesotomy

IX **Ophthalmic Procedures:**

(a) To invert eye-lids;

(b) To give Subconjunctival injection;
(c) To perform appellation of eye-lashes;
(d) To measure the refractive error and advise correctional glasses;
(e) To perform nasolacrimal duct syringing for potency

X. **Dental Procedures:**

To perform dental extraction

XI **Community Healthy:**

(a) To be able to supervise and motivate, community and para-professionals for corporate efforts for the health care;
(b) To be able to carry on managerial responsibilities, e.g.Magangement of stores, indenting and stock keeping and accounting
(c) Planning and management of health camps;
(d) Implementation of national health programmes;
(e) To effect proper sanitation measures in the community, e.g.disposal of infected garbage, chlorination of drinking water;
(f) To identify and institute and institute control measures for epidemics including its proper data collecting and reporting.

XII **Forensic Medicine Including Toxicology**

(a) To be able to carry on proper medicolegal examination and documentation of injury and age reports.
(b) To be able to conduct examination for sexual offences and intoxication;
(c) To be able to preserve relevant ancillary material for medico legal examination;
(d) To be able to identify important post-mortem findings in common un-natural deaths.

XII **Management of Emergency**

(a) To manage acute anaphylactic shock;
(b) To manage peripheral vascular failure and shock;
(c) To manage acute pulmonary oedema and LVF;
(d) Emergency management of drowning, poisoning and seizures
(e) Emergency management of bronchial asthma and status asthmaticus;
(f) Emergency management of hyperpyrexia;
(g) Emergency management of comatose patients regarding airways, positioning prevention of aspiration and injuries
(h) Assess and administer emergency management of burns

APPENDIX-C

Prescribed Teaching Hours and Suggested Model Time Tables:-

Following minimum teaching hours are prescribed in various disciplines:

A. **Pre-Clinical Subjects :** (Phase-1-First and Second Semester)

Anatomy	650 Hrs.
Physiology	480 Hrs.
Biochemistry	240 Hrs.
Community Medicine	60 Hrs.

B. **Para-Clinical Subjects:** (Phase-II-5th to 7th Semester)

Pathology	300 Hrs.
Pharmacology	300 Hrs.
Microbiology	250 Hrs.

Community Medicine 200 Hrs. (including 8 weeks postings of 3 hrs each)

Forensic Medicine 100 Hrs.

Teaching of para-clinical subjects shall be 4 hrs per day in 3rd Hrs Semester and 3Hrs per day in 4th and 5th Semesters (See attached Time Table)

C. Clinical Subjects

1. Clinical postings as per chart attached.
2. Theory lectures, demonstrations and Seminars etc.in addition to clinical postings as under. The clinical lectures to be held from 4th Semester onwards (See attached Time Table)

-	Gen-Medicine	300 Hours		Gen. Surgery	300 Hours
-	Paediatrics	100 ”		Orhopedics	100 “
-	T.B. and Chest	20 “		Ophthalmology	100 “
-	Psychiatry	20 “		ENT	70 “
-	Skin and STD	30 “		Radiology	20 “
-	Community Medicine	50 “		Dentistry	10 “
-	Anaesthesia	20 “		Obst & Gynae. inclusive	300 “

Note

This period of training is minimum suggested. Adjustments where required depending on availability of time be made.

This period of training does not include university examination period.

Extra time available be devoted to other Sub-specialities.

During semesters 3 to 9 following clinical postings for each student, of 3 hrs. duration is suggested for various departments after introductory course in Clinical Methods in Medicine and surgery of 2 weeks each for the whole class.

Subjects	3rd Sem-ester weeks	4th Sem-ester weeks	5th Sem-ester weeks	6th Sem-ester weeks	7th Sem-ester weeks	8th Sem-ester weeks	9th Sem-ester weeks	Total
General Medicine	6	-	4	-	4	6	6	26
Paediatries	-	2	-	2	2	4	-	10
TB and Chest	-	2	-	-	-	-	-	02
Skin and STD	-	2	-	2	-	2	-	06
Psychiatry	-	-	2	-	-	-	-	02
Radiology	-	-	-	-	2	-	-	02
Gen Surgery	6	-	4	-	4	6	6	26
Orthopaed-ics	-	-	4	4	-	-	2	10
Opthalmo-logy	-	4	-	4	-	-	2	10
ENT	-	4	-	4	-	-	-	08
Obst. &Gyn. And Family Planning	2	4	4	-	4	4	6	24
Comm. Med.	4	4	-	4	-	-	-	12
Casualty	-	-	-	2	-	-	-	02
Dentistry	-	-	-	-	2	-	-	02
Total	18	22	18	22	18	22	22	142

Clinical methods in Medicine and Surgery for whole class will be for 2 weeks each respectively at the start of 3rd semsester.

This posting will include training in Radiodiagnosis & Radiotherapy where existent.

This posting includes exposure to Rehabilitation Physiotherapy

This posting includes exposure to laboratory medicine and infectious diseases.

This posting includes exposure to dressing and Anaesthesia

This include maternity training and Family medicine and the 3rd semester posting shall be in Family Welfare Planning.

PHASE –II

Third Semester

Days/Time	8-9	9-10	10-11	11-12	12-1	1-2	2-3	3-4
Mon	Para Clinical Lectures		Clinical Postings		Para Clinical Lectures		Practicals	
Tues	do		do		do	L	Para-Clinical	
Wed	do		do		do	U	Do	
Thurs	do		do		do	N	Do	
Fri	do		do		do	C	Do	
Sat	do		do		do	H	Do	

Note : These are suggested time tables. Adjustments where required, depending upon the availability of time and facility, be made.

Fourth and Fifth Semester

Days/Time	8-9	9-10	10-11	11-12	12-1	1-2	2-3	3-4
Mon	Lectures In Clinical Subjects		Clinical Posting		Lectures in Para-Lectures Subjects		Practicals	
Tues	do		do		do	L	Para-Clinical	
Wed	do		do		do	U	Do	
Thurs	do		do		do	N	Do	
Fri	do		do		do	C	Do	
Sat	do		do		do	H	Do	

Sixth,Seventh,Eighth & Ninth Semester

Days/Time	8-9	9-10	10-11	11-12	12-1	1-2	2-3	3-4
Mon		Lectures In Clinical Subjects		Clinical Postings	Lectures in Demonstration in clinical subjects		Practicals Demonstrations in Clinical Subjects	
Tues		do		do	do	L		
Wed		do		do	do	U	Do	
Thurs		do		do	do		Do	
Fri		do		do	do	N	Do	
Sat		do		do	do	C	Do	
						H		

Note: These are suggested time tables. Adjustments where required, depending upon the availability of time and facility, be made.

AMENDMENTS NOTIFED IN THE GAZETTE OF INDIA IN EXISTING REGULATIONS

I. REGULATIONS ON GRADUATE MEDICAL EDUCATION

1. Published in Part III Section 4 of the Gazette of India on 29th May, 1999.
In the Regulations on Graduate Medical Education, 1997 –

(a) In Regulation 4 for clause (1), the following shall be substituted, namely -

"(1) He/She shall complete the age of 17 years on or before 31st December of the year of admission to the MBBS course."

(b) In the Regulations 5, for clause (5) the following be substituted namely -
"(5) Procedure for selection to MBBS course shall be as follows:-

(1) In case of admission on the basis of qualifying examination under clause (1) based on merit, a candidate for admission to MBBS course must have passed in the subjects of Physics, Chemistry, Biology and English individually and must have obtained a minimum of 50% marks taken together in Physics, Chemistry and Biology at the qualifying examination as mentioned in clause (2) of regulation 4. In respect of candidates belonging to Scheduled Castes, Scheduled Tribes or Other Backward Classes, the marks obtained in Physics, Chemistry and Biology taken together in qualifying examination be 40% instead of 50% as above.

(2) In case of admission on the basis of competitive entrance examination under clause (2) to (4) of this regulation, a candidate must have passed in the subjects of Physics, Chemistry and Biology

and English individually and must have obtained a minimum of 50% marks taken together in Physics, Chemistry and Biology at the qualifying examination as mentioned in clause (2) of regulation 4 and in addition must have come in the merit list prepared as a result of such competitive entrance examination by securing not less than 50% marks in Physics, Chemistry and Biology taken together in the competitive examination. In respect of candidates belonging to Scheduled Castes, Scheduled Tribes or other Backward classes the marks obtained in Physics, Chemistry and Biology taken together in qualifying examination and competitive entrance examination be 40% instead of 50% as stated above. Provided that a candidate who has appeared in the qualifying examination the result of which has not been declared, he may be provisionally permitted to take up the competitive entrance examination and in case of selection for admission to the MBBS course, he shall not be admitted to that course until he fulfills the eligibility criteria under regulation 4.

Sd/

(Dr. M. Sachdeva)
Secretary, MCI

2. Published in Part III Section 4 of the Gazette of India 2ndf July, 2002.

In the Regulations on Graduate Medical Education, 1997, in regulation 13, after sub-section (9), the following sub-regulation shall be inserted, namely –

"(10) The grace marks upto a maximum of five marks may be awarded at the discretion of the University to a student who has failed only in one subject but has passed in all other subject.

Sd/

(Dr. M. Sachdeva)
Secretary, MCI

3. Published in Part III Section 4 of the Gazette of India on 30th September, 2003.

"In Regulation 7, under Sub-Regulation, the words, "for which he will be permitted not more than four chances (actual examination), provided four chances are completed in three years from the date of enrolment" shall be deleted."

Sd/-

Lt. Co. (Retd.) Dr. ARN Setalvad
Secretary

4. Published in Part III Section 4 of the Gazette of India on 16th October, 2003.

In Regulation 12 –

(i) for sub-regulation (I), the following shall be substituted namely –

"(I) ATTENDANCE: 75% attendance in a subject for appearing in the examination is compulsory inclusive of attendance in non-lecture teaching i.e. seminars, group discussions, tutorials, demonstrations, practicals, hospital (Teritary Secondary, Primary) posting and bed side clinics etc."

(ii) in sub-regulation (2) for clause (v), the following shall be substituted, namely –

"(v) student must secure atleast 35% marks of the total marks fixed for internal assessment in a particular subject in order to be eligible to appear in final university examination of that subject."

Sd/-
Lt. Co. (Retd.) Dr. ARN Setalvad
Secretary

5. *Published in Part III Section 4 of the Gazette of India on Ist March, 2004.*

In the Regulations on Graduate Medical Education, 1997, in regulation 7 –

(i) for sub-regulation (6) the following sub-regulation shall be substituted namely –

"(6) The Universities and other authorities concerned shall organize admission process in such a way that teaching in first semester starts by Ist of August each year. For this purpose, they shall follow the time schedule indicated in APPENDIX E"

(ii) after sub-regulation (6), the following sub-regulations shall be inserted:

"(6A) There shall be no admission of students in respect of any academic session beyond 30th September under any circumstance. The Universities shall not register any student admitted beyond the said date.

(6B) the Medical Council of India may direct, that any student identified as having obtained admission after the last date for closure of admission be discharged from the course of study, or any medical qualification granted to such a student shall not be a recognized qualification for the purpose of the Indian Medical Council Act, 1956.

The institution which grants admission to any student after the last date specified from the same shall also be liable to face such action as may be prescribed by MCI including surrender of seats equivalent to the extent of such admission made from its sanctioned intake capacity for the succeeding academic year".

Sd/-
Lt. Co. (Retd.) Dr. ARN Setalvad
Secretary

APPENDIX E

Inserted in terms of notification published on 01.03.2004 in the Gazette of India .

TIME SCHEDULE FOR COMPLETION OF THE ADMISSION PROCESS FOR FIRST MBBS COURSE

Schedule for Admission	*Seats filled up by Central Government through all India Entrance Examination*	*Seats filled up by the State Govts./Instt.*
Conduct of Entrance Examination	*Month of May*	*Month of May*
Declaration of Result of Qualifying Exam./Entrance Exam.	*By 5th June*	*By 15th June*
Ist round of counseling/admission	*To be over by 30th June*	*To be over by 25th July*
Last date for joining the allotted college and course	*Within 15 days from the date of allotment of seats @@*	*31st July*
2nd round of counselling for allotment of seats from waiting list	*To be over by 8th August*	*Upto 28th August*
Last date for joining for candidates allotted seats in 2nd round of conseling from the waiting list	*Within 15 days from the date of allotment of seats. (seats vacant after 22nd August will be surrendered back to the States / Colleges)*	
Commencement of academic session	*Ist of August*	
Last date upto which students can be admitted against vacancies arising due to any reason	*30th September*	

NOTE:@@ Head of the College should intimate the vacancies existing after the last date of joining the course by the candidate concerned in respect of the All India Quota of seats to the DGHS within seven days and latest by 23rd of July.

**The above SCHEDULE has been substituted as under:*

TIME SCHEDULE FOR COMPLETION OF THE ADMISSION PROCESS FOR FIRST MBBS COURSE

Sr. No.	Schedule for Admission	Seats to be filled up by the Central Government through the All India Entrance Examination	Seats to be filled up by the State Govt./ Institution
1.	Conduct of Entrance Examination	Between 1st to 7th May	Between 10th to 17th May
2.	Declaration of the Result of the Qualifying Exam/Entrance Exam.	By 1st June	By 1st June
3.	Ist round of counseling/admission	To be over by 25th June	Between 6th July to 15thJuly
4.	Last date for joining the allotted college and the course	By 5thJuly	By 22ndJuly
5.	2nd round of counseling / admission for vacancies	Between 23rdJuly to 30thJuly	Between 10thto 22ndAugust
6.	Last date of joining for the 2nd round of counseling /admission	By 9th August	By 28thAugust
7.	Commencement of academic session / term	1st of August	1st of August
8.	Last date upto which students can be admitted/Joined against vacancies arising due to any reason.	-	By 31st August

Note:

1. All India Quota Seats remaining vacant after last date for joining, i.e. 9th August will be deemed to be converted into state quota.
2. Institute / college / courses permitted after 31st May will not be considered for admission/allotment of seats for current academic year.
3. In any circumstances, last date for admission / joining will not be extended after 31st August.

****in terms of notification published on 14.01.2016 in the Gazette of India.***

APPENDIX F

Inserted in terms of notification published on 08.08.2016 in the Gazette of India .

TIME SCHEDULE FOR COMPLETION OF THE ADMISSION PROCESS FOR FIRST MBBS COURSE (Academic Session 2016-17)

Schedule for Admission	*Seats filled up All India Quota*	*Seats filled up by the State Govt./Institutions*
Conduct of National Eligibility Entrance Test (NEET 2016)	*NEET 1 Conduct on 1st May 2016 NEET 2 on 24th July 2016*	*NEET 1 Conduct on 1st May 2016 NEET 2 on 24th July 2016*
Declaration of Result of Qualifying Examination /Entrance Examination	*17th August, 2016*	*17th August, 2016*
1st Round of Counseling/Admission	*22nd August to 27th August, 2016*	*3rd September to 5th September, 2016*
Last date for joining the allotted college and course	*3rd September, 2016*	*By 8th September, 2016*
2nd Round of Counseling/Admission	*9th to 14th September, 2016*	*21st September to 23rd September, 2016*
Last date for joining for the candidates allotted seats in 2nd Round of Counseling	*By 20th September, 2016*	*By 26th September, 2016*
Commencement of academic session	*3rd September, 2016*	*3rd September, 2016*
Last date up to which students can be admitted against vacancies arising due to any reason	*Not applicable*	*30th September, 2016*

SCHEDULE FOR ONLINE COUNSELING (ALLOTMENT PROCESS) FOR ALL INDIA QUOTA UG (MBBS/BDS) SEATS -2016

All India Quota (Online Counseling)			
Sl. No.	*Event*	*Duration*	*Days*
1.	*Main Counseling Registration Choice Filling & Indicative Seat*	*22nd August to 25th August, 2016 (Registration will be open up to 5:00 PM of*	*4 days*

		25th August 2016 only)	
2.	*Exercising of Choices and Locking*	*25th August, 2016 (up to 05:00 PM of 25th August, 2016)*	*1 Day*
3.	*Process of Seat Allotment-Round 1*	*26th August, 2016*	*1 Day*
4.	*Round 1 Result Publish*	*27th August, 2016*	*1 Day*
5.	*Reporting at the Allotted Medical/Dental College against 1st Round*	*28th August to 3rd September, 2016 (up to 05:00 PM of 3rd September, 2016)*	*7 Days*
6.	*Exercising of Choices and Locking (Round 2)*	*9th September 2016 to 10th September 2016*	*2 Days*
7.	*Process of Seat Allotment-Round 2*	*11th September, 2016*	*1 Day*
8.	*Round 2 Result Publish*	*12th September, 2016*	*1 Day*
9.	*Reporting at the Allotted Medical /Dental College against Round 2*	*13th to 20th September, 2016 (up to 05:00 PM of 20th September, 2016*	*8 Days*
10.	*Transfer of vacant seats to state Quota*	*20th September, 2016 (After 05:00 PM)*	*-*

(Time 05:00 PM mentioned above is by computer server time)
Commencement of MBBS/BDS first year session-from 13th September, 2016

The 8th row of Appendix 'F', the commencement of academic session shall be read as 13th September in terms of Notification dated 08.10.2016 published in the Gazette of India .

The following shall be added in terms of notification published on 04.07.2017 in the Gazette of India

TIME SCHEDULE FOR COMPLETION OF THE ADMISSION PROCESS FOR FIRST MBBS COURSE
(Academic Session 2017-18)

Schedule for Admission	*Seats filled up by DGHS for All India Quota (15%) /Deemed/ Central Universities*	*Seats filled up by the State Govt./Institutions*
Conduct of Examination (NEET 2017)	*7th MAY 2017*	*7th May 2017*
Declaration of Result of Qualifying Examination/Entrance	*26th JUNE, 2017*	*26th JUNE 2017*

Examination		
1st Round of counseling/Admission	***3rd JULY to 15th JULY 2017***	***16th JULY to 24th JULY 2017***
Last date for Joining the allotted college and course.	***22nd JULY 2017***	***By 31st JULY 2017***
2nd Round of Counseling/Admission	***1st to 7th AUGUST, 2017***	***8th AUGUST to 19th AUGUST 2017***
Last date for joining for the candidates allotted seats in 2nd Round of counseling	***By 16th AUGUST 2017***	***By 25th AUGUST 2017***
Mop up round by DGHs for Deemed University/Central Universities seats	***18th AUGUST to 27th AUGUST 2017***	
Mop up rounds by States	***Not applicable***	***26th to 28th AUGUST 2017***
Commencement of academic session	***1st AUGUST, 2017***	
Last date up to which students can be admitted against vacancies arising due to any reason by Deemed Universities / Medical Institutions	***Not applicable***	***31st August 2017***

Note:

1. ***All India Quota Seats (15%) remaining vacant after last date for joining, i.e. 16th August, 2017 will be deemed to be converted into state quota.***
2. ***Institute/college/courses permitted after 31st May will not be considered for admission/allotment of seats for current academic year.***
3. ***In any circumstances, last date for admission/joining will not be extended after 31st August.***
4. ***For the purpose of ensuring faithful obedience to the above time-schedule, Saturday, Sunday or Holidays (except National Holiday on account of Independence Day on Tuesday, 15th August) shall be treated as working days.***

The following shall be substituted in terms of notification published on 05.02.2018 in the Gazette of India

APPENDIX F

TIME SCHEDULE FOR COMPLETION OF THE ADMISSION PROCESS FOR FIRST MBBS COURSE FOR THE ACADEMIC YEAR 2018-19 AND ONWARDS

SI. No.	***Schedule for Admission***	***Central Counseling***		***State Counseling***
		All India Quota	***Deemed + CI***	
1.	*Conduct of Exam*	*By 10th May*		
2.	*Declaration of Result*	*By First Week of June*		
3.	*Ist round of Counseling*	*12th June – 24th June*	*12th June – 24th June*	*25th June – 5th July*
4.	*Last date of Joining*	*3rd July*	*3rd July*	*12th July*
5.	*II round of Counseling*	*6th July – 12th July*	*6th July – 12th July*	*15th July – 26th July*
6.	*Last date of Joining*	*22nd July*	*22nd July*	*3rd August*
7.	*Mop-up Round*		*12th Aug. – 22nd Aug.**	*4th Aug. – 8th Aug.*
8.	*Last date of Joining*		*26th August**	*12th August*
9.	*Forwarding the list of students in order of merit equaling to ten times the number of vacant seats to the Medical Colleges by the Counseling Authority*		*27th August*	*13th August*
10.	*Last date of Joining*		*31st August*	*18th August*

The following shall be added in terms of notification published on 18.05.2018 in the Gazette of India

In Appendix 'F' the following "Note" **shall be added below the** Time Schedule for completion of the admission process for first MBBS course for the academic year 2018-19 and onwards: -

Note:

1. All India Quota Seats (15%) remaining vacant after last date for joining, i.e.22nd July of the present Admission year will be deemed to be converted into State quota.

2. Institute/college/courses permitted after 31st May will not be considered for admission/ allotment of seats for current academic year.

3. In any circumstances, last date for admission/joining will not be extended after 31st August.

4. For the purpose of ensuring faithful obedience to the above time-schedule, Saturday, Sunday or Holidays (except National Holiday on account of Independence Day, 15th August) shall be treated as working days.

5. The following Matrix shall be applicable with regard to permissibility to students to exercise fresh choice during counseling:-

S.No.	**Round**	**Free Exit**	**Exit with forfeiture of fees**	**Ineligible for further counseling**	**Amount of registration fee**
1.	AIQ I/Deemed	✓			
2.	AIQ II/ Deemed		If not Joined	If joined	Government – Rs. 10,000 (half for SC/ST/OBC) Deemed – Rs. 2,00,000
3.	State Quota I	✓			
4.	State Quota II		If not joined	If joined	Government – Rs. 10,000 (half for SC/ST/OBC) Private – Rs. 1,00,000
5.	State Quota Mop-up			If joined	
6.	Deemed Mop-Up			If joined	

6. As per MCI regulations, DGHS counseling would include AIQ seats, Central Institutions and Deemed Universities. State/UT counseling would include State Quota seats and all private colleges in the States/UTs.

Appendix G

(Refer Regulation 4 & 5)

A SCHEDULE is annexed regarding, "SPECIFIED DISABILITY" clause (zc) of section 2, that states as under,

1. Physical disability

A. Locomotor disability (a person's inability to execute distinctive activities associated with movement of self and objects resulting from affliction of musculoskeletal or nervous system or both), including—

(a) "leprosy cured person" means a person who has been cured of leprosy but is suffering from—

(i) loss of sensation in hands or feet as well as loss of sensation and paresis in the eye and eye-lid but with no manifest deformity;

(ii)manifest deformity and paresis but having sufficient mobility in their hands and feet to enable them to engage in normal economic activity;

(iii)extreme physical deformity as well as advanced age which prevents him/her from undertaking any gainful occupation, and the expression "leprosy cured" shall construed accordingly;

(b) "cerebral palsy" means a Group of non-progressive neurological condition affecting body movements and muscle coordination, caused by damage to one or more specific areas of the brain, usually occurring before, during or shortly after birth;

(c) "dwarfism" means a medical or genetic condition resulting in an adult height of 4 feet 10 inches (147 centimeters) or less;

(d) "muscular dystrophy" means a group of hereditary genetic muscle disease that weakens the muscles that move the human body and persons with multiple dystrophy have incorrect and missing information in their genes, which prevents them from making the proteins they need for healthy muscles. It is characterized by progressive skeletal muscle weakness, defects in muscle proteins, and the death of muscle cells and tissue; (e) "acid attack victims" means a person disfigured due to violent assaults by throwing of acid or similar corrosive substance.

B. Visual impairment—

(a) "blindness" means a condition where a person has any of the following conditions, after best correction—

(i) total absence of sight; or

(ii) visual acuity less than 3/60 or less than 10/200 (Snellen) in the better eye with best possible correction; or

(iii) limitation of the field of vision subtending an angle of less than 10 degree.

(b) "low-vision" means a condition where a person has any of the following conditions, namely:—

(i) visual acuity not exceeding 6/18 or less than 20/60 upto 3/60 or upto 10/200 (Snellen) in the better eye with best possible corrections; or

(ii) limitation of the field of vision subtending an angle of less than 40 degree up to 10 degree.

C. Hearing impairment -

(a) "deaf" means persons having 70 DB hearing loss in speech frequencies in both ears;

(b) "hard of hearing" means person having 60 DB to 70 DB hearing loss in speech frequencies in both ears;

D. "speech and language disability" means a permanent disability arising out of conditions such as laryngectomy or aphasia affecting one or more components of speech and language due to organic or neurological causes.

2. Intellectual disability, a condition characterized by significant limitation both in intellectual functioning (reasoning, learning, problem solving) and in adaptive behavior which covers a range of every day, social and practical skills, including—

(a) "specific learning disabilities" means a heterogeneous group of conditions wherein there is a deficit in processing language, spoken or written, that may manifest itself as a difficulty to comprehend, speak, read, write, spell, or to do mathematical calculations and includes such conditions as perceptual disabilities, dyslexia, dysgraphia, dyscalculia, dyspraxia and developmental aphasia;

(b) "autism spectrum disorder" means a neuro-developmental condition typically appearing in the first three years of life that significantly affects a person's ability to communicate, understand relationships and relate to others, and is frequently associated with unusual or stereotypical rituals or behaviours.

3. Mental behaviour,— "mental illness" means a substantial disorder of thinking, mood, perception, orientation or memory that grossly impairs judgment, behaviour, capacity to recognize reality or ability to meet the ordinary demands of life, but does not include retardation which is a condition of arrested or incomplete development of mind of a person, specially characterized by subnormality of intelligence.

4. Disability caused due to—

(a) chronic neurological conditions, such as—

(i) "multiple sclerosis" means an inflammatory, nervous system disease in which the myelin sheaths around the axons of nerve cells of the brain and spinal cord are damaged, leading to demyelination and affecting the ability of nerve cells in the brain and spinal cord to communicate with each other;

(ii) "parkinson's disease" means a progressive disease of the nervous system marked by tremor, muscular rigidity, and slow, imprecise movement, chiefly affecting

middle-aged and elderly people associated with degeneration of the basal ganglia of the brain and a deficiency of the neurotransmitter dopamine.

(b) Blood disorder—

(i) "haemophilia" means an inheritable disease, usually affecting only male but transmitted by women to their male children, characterized by loss or impairment of the normal clotting ability of blood so that a minor would may result in fatal bleeding;

(ii) "thalassemia" means a group of inherited disorders characterized by reduced or absent amounts of haemoglobin.

(iii) "sickle cell disease" means a hemolytic disorder characterized by chronic anemia, painful events, and various complications due to associated tissue and organ damage; "hemolytic" refers to the destruction of the cell membrane of red blood cells resulting in the release of hemoglobin.

5. Multiple Disabilities (more than one of the above specified disabilities) including deaf blindness which means a condition in which a person may have combination of hearing and visual impairments causing severe communication, developmental, and educational problems.

6. Any other category as may be notified by the Central Government.

Note: Any amendment to the Schedule to the RPWD Act, 2016, shall consequently stand amended in the above schedule.

MEDICAL COUNCIL OF INDIA

COMPETENCY BASED UNDERGRADUATE CURRICULUM FOR THE INDIAN MEDICAL GRADUATE

Knows → Knows how → Shows → Shows how → Performs

Enumerate | Describe | Observe | Demonstrate | Assist

Counsel

Analyse

Guide

Correlate

Critique

Prescribe

Integrate

Communicate

Interpret

Collaborate

Clinician | Communicator | Team Leader | Professional | Lifelong Learner

Knowledge | Skills | Attitude | Values | Responsiveness | Communication

VOLUME-I (2018)

COMPETENCY BASED UNDERGRADUATE CURRICULUM FOR THE INDIAN MEDICAL GRADUATE

2018

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भारतीय आयुर्विज्ञान परिषद के अधिक्रमण में शासी बोर्ड

BOARD OF GOVERNORS
IN SUPERSESSION OF MEDICAL COUNCIL OF INDIA

FOREWORD

The Medical Council of India, aware of its responsibilities in creation of trained health manpower, has been engaged for the past few years in updating the medical curriculum for undergraduates and postgraduates to be in consonance with the changing health needs of the country. The task of updating and reorganization of the postgraduate curriculum in nearly 50 broad specialty disciplines to the competency pattern was accomplished by the Academic Cell of the Council with the help of subject experts and members of its Reconciliation Board and have been uploaded on the Council Website for use of the medical fraternity.

The Council visualized that the Indian Medical Graduate, at the end of the undergraduate training program, should be able to recognize "health for all" as a national goal and should be able to fulfill his/her societal obligations towards the realization of this goal. To fulfill the mandate of the undergraduate medical curriculum which is to produce a clinician, who understands and is able to provide preventive, promotive, curative, palliative and holistic care to his patients, the curriculum must enunciate clearly the competencies the student must be imparted and must have learnt, with clearly defined teaching-learning strategies and effective methods of assessment. The student should be trained to effectively communicate with patients and their relatives in a manner respectful of the patient's preferences, values, beliefs, confidentiality and privacy and to this purpose, a book on Attitude, Ethics & Communication was prepared by the Medical Council of India; the teaching faculty of medical colleges have been receiving training on this module since 2015.

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BOARD OF GOVERNORS
IN SUPERSESSION OF MEDICAL COUNCIL OF INDIA

Competency based Medical Education provides an effective outcome-based strategy where various domains of teaching including teaching learning methods and assessment form the framework of competencies. Keeping this objective as the core ingredient, the Medical Council of India with the help of panel of experts drawn from across the country, laid the basic framework for the revised undergraduate medical curriculum. Over the past four years, a group of highly committed medical professionals working as Members of the MCI Reconciliation Board developed this information into a document incorporating appropriate teaching-learning strategies, tools and techniques of teaching, and modes of assessment which have culminated in the current competency based undergraduate curriculum. We understand that maximum efforts were made to encourage integrated teaching between traditional subject areas using a problem-based learning approach starting with clinical or community cases and exploring the relevance of various preclinical disciplines in both the understanding and resolution of the problem. All efforts have been made to de-emphasize compartmentalisation of disciplines so as to achieve both horizontal and vertical integration in different phases. We are proud of their work accomplishment and congratulate them in the onerous task accomplished.

It gives us great satisfaction to state that the **'competency based undergraduate curriculum'** that has been prepared by the Medical Council of India would definitely serve the cause of medical education and in creating a competent Indian Medical Graduate to serve the community.

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The Competency based Undergraduate Curriculum for MBBS students prepared by subject experts was scrutinized by members of the Reconciliation Board and Academic Cell. The contents, embodied in this document, have received Copyright from the Register of Copyrights, Copyright Office, Government of India with Registration Number L-63913/2016.

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COMPETENCY BASED UNDERGRADUATE CURRICULUM
FOR
THE INDIAN MEDICAL GRADUATE

Preamble

The new Graduate Medical Education Regulations attempts to stand on the shoulder of the contributions and the efforts of resource persons, teachers and students (past and present). It intends to take the learner to provide health care to the evolving needs of the nation and the world.

More than twenty years have passed since the existing Regulations on Graduate Medical Education, 1997 was notified, necessitating a relook at all aspects of the various components in the existing regulations and adapt them to the changing demography, socio-economic context, perceptions, values and expectations of stakeholders. Emerging health care issues particularly in the context of emerging diseases, impact of advances in science and technology and shorter distances on diseases and their management also need consideration. The strong and forward looking fundamentals enshrined in the Regulations on Graduate Medical Education, 1997 has made this job easier. A comparison between the 1997 Regulations and proposed Graduate Medical Education Regulations, 2018 will reveal that the 2018 Regulations have evolved from several key principles enshrined in the 1997 Regulations.

The thrust in the new regulations is continuation and evolution of thought in medical education making it more learner-centric, patient-centric, gender-sensitive, outcome -oriented and environment appropriate. The result is an outcome driven curriculum which conforms to global trends. Emphasis is made on alignment and integration of subjects both horizontally and vertically while respecting the strengths and necessity of subject-based instruction and assessment. This has necessitated a deviation from using “broad competencies”; instead, the reports have written end of phase subject (sub) competencies. These “sub-competencies” can be mapped to the global competencies in the Graduate Medical Education Regulations.

A significant attempt has been made in the outcome driven undergraduate curriculum to provide the orientation and the skills necessary for life-long learning to enable proper care of the patient. In particular, the curriculum provides for early clinical exposure, electives and longitudinal care. Skill acquisition is an indispensable component of the learning process in medicine. The curriculum reinforces this aspect by necessitating certification of certain essential skills. The experts and the writing group have factored in patient availability, access, consent, number of students in a class etc. in suggesting skill acquisition and assessment methods; use of skills labs, simulated and guided environments are encouraged. In the pre-internship years,- the highest level of skill acquisition is a show how (SH) in a simulated or guided environment; few skills require independent performance and certification - these are marked with P (for performance). Opportunity to 'perform' these skills will be available during internship.

The importance of ethical values, responsiveness to the needs of the patient and acquisition of communication skills is underscored by providing dedicated curriculum time in the form of a longitudinal program based on Attitude, Ethics and Communication (AETCOM) competencies. Great emphasis has been placed on collaborative and inter-disciplinary teamwork, professionalism, altruism and respect in professional relationships with due sensitivity to differences in thought, social and economic position and gender.

In addition to the above, an attempt has been made to allow students from diverse educational streams and backgrounds to transition appropriately through a Foundation Course. Dedicated time has been allotted for self directed learning and co-curricular activities.

Formative and internal assessments have been streamlined to achieve the objectives of the curriculum. Minor tweaks to the summative assessment have been made to reflect evolving thought and regulatory requirements. Curricular governance and support have been strengthened, increasing the involvement of Curriculum Committee and Medical Education Departments/Units.

The curriculum document in conjunction with the new Graduate Medical Education Regulations (GMR), when notified, must be seen as a "living document" that should evolve as stakeholder requirements and aspirations change. We hope that the current GMR does just that. The Medical Council of India is

grateful to all the teachers, subject experts, process experts, patients, students and trainees who have contributed through invaluable inputs, intellectual feedbacks and valuable time spent to make this possible. This document would not have been possible without the dedicated and unstinting intellectual, mental and time-consuming efforts of the members of the Reconciliation Board of the Council and the Academic Cell of MCI.

How to use the Manual

This Manual is intended for curriculum planners in an institution to design learning and assessment experiences for the MBBS student. Contents created by subject experts have been curated to provide guidance for the curriculum planners, leaders and teachers in medical schools. They must be used with reference to and in the context of the Regulations.

Section 1

Competencies for the Indian Medical Graduate

Section 1 - provides the global competencies extracted from the Graduate Medical Education Regulations, 2018. The global competencies identified as defining the roles of the **Indian Medical Graduate** are the broad competencies that the learner has to aspire to achieve; teachers and curriculum planners must ensure that the learning experiences are aligned to this Manual.

Extract from the Graduate Medical Education Regulations, 2018

2. Objectives of the Indian Graduate Medical Training Programme

The undergraduate medical education program is designed with a goal to create an "Indian Medical Graduate" (IMG) possessing requisite knowledge, skills, attitudes, values and responsiveness, so that she or he may function appropriately and effectively as a physician of first contact of the community while being globally relevant. To achieve this, the following national and institutional goals for the learner of the Indian Medical Graduate training program are hereby prescribed:-

2.1. National Goals

At the end of undergraduate program, the Indian Medical Graduate should be able to:

(a) recognize “health for all” as a national goal and health right of all citizens and by undergoing training for medical profession fulfill his/her social obligations towards realization of this goal.

(b) learn every aspect of National policies on health and devote herself/himself to its practical implementation.

(c) achieve competence in practice of holistic medicine, encompassing promotive, preventive, curative and rehabilitative aspects of common diseases.

(d) develop scientific temper, acquire educational experience for proficiency in profession and promote healthy living.

(e) become exemplary citizen by observance of medical ethics and fulfilling social and professional obligations, so as to respond to national aspirations.

2.2. Institutional Goals

In consonance with the national goals, each medical institution should evolve institutional goals to define the kind of trained manpower (or professionals) they intend to produce. The Indian Medical Graduates coming out of a medical institute should:

(a) be competent in diagnosis and management of common health problems of the individual and the community, commensurate with his/her position as a member of the health team at the primary, secondary or tertiary levels, using his/her clinical skills based on history, physical examination and relevant investigations.

(b) be competent to practice preventive, promotive, curative and rehabilitative medicine in respect to the commonly encountered health problems.

(c) appreciate rationale for different therapeutic modalities, be familiar with the administration of the "essential drugs" and their common side effects.

(d) be able to appreciate the socio-psychological, cultural, economic and environmental factors affecting health and develop humane attitude towards the patients in discharging one's professional responsibilities.

(e) possess the attitude for continued self learning and to seek further expertise or to pursue research in any chosen area of medicine, action research and documentation skills.

(f) be familiar with the basic factors which are essential for the implementation of the National Health Programs including practical aspects of the following:

(i) Family Welfare and Maternal and Child Health (MCH);

(ii) Sanitation and water supply;

(iii) Prevention and control of communicable and non-communicable diseases;

(iv) Immunization;

(v) Health Education;

(vi) Indian Public Health Standards (IPHS) at various level of service delivery;

(vii) Bio-medical waste disposal; and

(viii) Organizational and or institutional arrangements.

(g) acquire basic management skills in the area of human resources, materials and resource management related to health care delivery, General and hospital management, principal inventory skills and counseling.

(h) be able to identify community health problems and learn to work to resolve these by designing, instituting corrective steps and evaluating outcome of such measures.

(i) be able to work as a leading partner in health care teams and acquire proficiency in communication skills.

(j) be competent to work in a variety of health care settings.

(k) have personal characteristics and attitudes required for professional life including personal integrity, sense of responsibility and dependability and ability to relate to or show concern for other individuals.

All efforts must be made to equip the medical graduate to acquire the skills as detailed in Table 11 Certifiable procedural skills – A Comprehensive list of skills recommended as desirable for Bachelor of Medicine and Bachelor of Surgery (MBBS) – Indian Medical Graduate, as given in the Graduate Medical Education Regulations, 2018

2. 3. Goals for the Learner

In order to fulfil this goal, the Indian Medical Graduate must be able to function in the following roles appropriately and effectively:-

2.3.1. Clinician who understands and provides preventive, promotive, curative, palliative and holistic care with compassion.

2.3.2. Leader and member of the health care team and system with capabilities to collect, analyze, synthesize and communicate health data appropriately.

2.3.3. Communicator with patients, families, colleagues and community.

2.3.4. Lifelong learner committed to continuous improvement of skills and knowledge.

2.3.5. Professional, who is committed to excellence, is ethical, responsive and accountable to patients, community and profession.

3. Competency Based Training Programme of the Indian Medical Graduate

Competency based learning would include designing and implementing medical education curriculum that focuses on the desired and observable ability in real life situations. In order to effectively fulfil the roles as listed in clause 2, the Indian Medical Graduate would have obtained the following set of competencies at the time of graduation:

3.1. Clinician, who understands and provides preventive, promotive, curative, palliative and holistic care with compassion

3.1.1 Demonstrate knowledge of normal human structure, function and development from a molecular, cellular, biologic, clinical, behavioral and social perspective.

3.1.2. Demonstrate knowledge of abnormal human structure, function and development from a molecular, cellular, biological, clinical, behavioural and social perspective.

3.1.3 Demonstrate knowledge of medico-legal, societal, ethical and humanitarian principles that influence health care.

3.1.4 Demonstrate knowledge of national and regional health care policies including the National Health Mission that incorporates National Rural Health Mission (NRHM) and National Urban Health Mission (NUHM), frameworks, economics and systems that influence health promotion, health care delivery, disease prevention, effectiveness, responsiveness, quality and patient safety.

3.1.5. Demonstrate ability to elicit and record from the patient, and other relevant sources including relatives and caregivers, a history that is complete and relevant to disease identification, disease prevention and health promotion.

3.1.6. Demonstrate ability to elicit and record from the patient, and other relevant sources including relatives and caregivers, a history that is contextual to gender, age, vulnerability, social and economic status, patient preferences, beliefs and values.

3.1.7 Demonstrate ability to perform a physical examination that is complete and relevant to disease identification, disease prevention and health promotion.

3.1.8 Demonstrate ability to perform a physical examination that is contextual to gender, social and economic status, patient preferences and values.

3.1.9 Demonstrate effective clinical problem solving, judgment and ability to interpret and integrate available data in order to address patient problems, generate differential diagnoses and develop individualized management plans that include preventive, promotive and therapeutic goals.

3.1.10 Maintain accurate, clear and appropriate record of the patient in conformation with legal and administrative frameworks.

3.1.11 Demonstrate ability to choose the appropriate diagnostic tests and interpret these tests based on scientific validity, cost effectiveness and clinical context.

3.1.12 Demonstrate ability to prescribe and safely administer appropriate therapies including nutritional interventions, pharmacotherapy and interventions based on the principles of rational drug therapy, scientific validity, evidence and cost that conform to established national and regional health programmes and policies for the following:

i) Disease prevention,

ii) Health promotion and cure,

iii) Pain and distress alleviation, and

iv) Rehabilitation and palliation.

3.1.13 Demonstrate ability to provide a continuum of care at the primary and/or secondary level that addresses chronicity, mental and physical disability.

3.1.14 Demonstrate ability to appropriately identify and refer patients who may require specialized or advanced tertiary care.

3.1.15 Demonstrate familiarity with basic, clinical and translational research as it applies to the care of the patient.

3.*2.* ***Leader and member of the health care team and system***

3.2.1 Work effectively and appropriately with colleagues in an inter-professional health care team respecting diversity of roles, responsibilities and competencies of other professionals.

3.2.2 Recognize and function effectively, responsibly and appropriately as a health care team leader in primary and secondary health care settings.

3.2.3 Educate and motivate other members of the team and work in a collaborative and collegial fashion that will help maximize the health care delivery potential of the team.

3.2.4 Access and utilize components of the health care system and health delivery in a manner that is appropriate, cost effective, fair and in compliance with the national health care priorities and policies, as well as be able to collect, analyze and utilize health data.

3.2.5 Participate appropriately and effectively in measures that will advance quality of health care and patient safety within the health care system.

3.2.6 Recognize and advocate health promotion, disease prevention and health care quality improvement through prevention and early recognition: in a) life style diseases and b) cancer, in collaboration with other members of the health care team.

3.3. ***Communicator with patients, families, colleagues and community***

3.3.1 Demonstrate ability to communicate adequately, sensitively, effectively and respectfully with patients in a language that the patient understands and in a manner that will improve patient satisfaction and health care outcomes.

3.3.2 Demonstrate ability to establish professional relationships with patients and families that are positive, understanding, humane, ethical, empathetic, and trustworthy.

3.3.3 Demonstrate ability to communicate with patients in a manner respectful of patient’s preferences, values, prior experience, beliefs, confidentiality and privacy.

3.3.4 Demonstrate ability to communicate with patients, colleagues and families in amanner that encourages participation and shared decision-making.

3.4. Lifelong learner committed to continuous improvement of skills and knowledge

3.4.1. Demonstrate ability to perform an objective self-assessment of knowledge and skills, continue learning, refine existing skills and acquire new skills.

3.4.2. Demonstrate ability to apply newly gained knowledge or skills to the care of the patient.

3.4.3. Demonstrate ability to introspect and utilize experiences, to enhance personal and professional growth and learning.

3.4.4. Demonstrate ability to search (including through electronic means), and critically revaluate the medical literature and apply the information in the care of the patient.

3.4.5. Be able to identify and select an appropriate career pathway that is professionally rewarding and personally fulfilling.

3.5. *Professional who is committed to excellence, is ethical, responsive and accountable to patients, community and the profession*

3.5.1. Practice selflessness, integrity, responsibility, accountability and respect.

3.5.2. Respect and maintain professional boundaries between patients, colleagues and society.

3.5.3. Demonstrate ability to recognize and manage ethical and professional conflicts.

3.5.4. Abide by prescribed ethical and legal codes of conduct and practice.

3.5.5. Demonstrate a commitment to the growth of the medical profession as a whole.

Section 2

Subject-wise outcomes

Section 2 contains subject-wise outcomes so called “sub-competencies” that must be achieved at the end of instruction in that subject. These are organised in tables and have two parts. The core subject outcomes are in first part. The second part in the same document (titled Integration) contains outcomes/competencies in other subjects which have been identified by experts in those subjects as requiring alignment or integration with the core subject.

Outcomes (competencies) in each subject are grouped according to topics number-wise. It is important to review the individual outcomes (competencies) in the light of the topic outcomes as a whole. For each competency outlined - the learning domains (Knowledge, Skill, Attitude, Communication) are identified. The expected level of achievement in that subject is identified as – [knows (K), knows how (KH), shows how (SH), perform (P)]. As a rule, ‘perform’ indicates independent performance without supervision and is required rarely in the pre-internship period. The outcome is a core (Y - must achieve) or a non-core (N - desirable) outcome. Suggested learning and assessment methods (these are suggestions) and explanation of the terms used are given under the section “definitions used in this document”. The suggested number of times a skill must be performed independently for certification in the learner’s log book is also given. Last two columns indicate subjects within the same phase and other phases with which the topic can be taught - together - aligned (temporal coordination), shared, correlated or nested.

The number of topics and competencies in each subject are given below:

Topics & outcomes in Pre-clinical & Para-clinical subjects

Sr. No.	Subjects	Number of topics	Number of outcomes
1.	**Human Anatomy**	82	409
2.	**Physiology**	11	137
3.	**Biochemistry**	11	89
4.	**Pharmacology**	05	85
5.	**Pathology**	36	182
6.	**Microbiology**	08	54
7.	**Forensic Medicine & Toxicology**	14	162
	Total	**167**	**1118**

Topics & outcomes in Medicine and Allied subjects

Sr. No.	Subjects	Number of topics	Number of outcomes
1.	**Community Medicine**	20	107
2.	**General Medicine**	26	506
3.	**Respiratory Medicine**	02	47
4.	**Pediatrics**	35	406
5.	**Psychiatry**	19	117
6.	**Dermatology, Venereology & Leprosy**	18	73
7.	**Physical Medicine & Rehabilitation**	09	43
	Total	**129**	**1299**

Topics & outcomes in Surgery and Allied subjects

Sr. No.	Subjects	Number of topics	Number of outcomes
1.	**General Surgery**	30	133
2.	**Ophthalmology**	09	60
3.	**Otorhinolaryngology**	04	76
4.	**Obstetrics & Gynaecology**	38	126
5.	**Orthopedics**	14	39
6.	**Anesthesiology**	10	46
7.	**Radiodiagnosis**	01	13
8.	**Radiotherapy**	05	16
9.	**Dentistry**	05	23
	Total	**116**	**532**

Section 3

Sample topics used for alignment & integration

Section 3 contains a sample selection of topics that run across the phases which can be used for alignment and integration. These are suggestions and institutions can select their own set of topics which can run across phases.

It is important to design the curriculum with a view to ensure with several broad outcomes in mind: a) achievement of the broad competencies by the learner at the end of the MBBS program, b) retain the subject - wise character of learning and assessment and ensure that phase-wise subject outcomes are met and assessed, c) teaching topics that are similar together thereby reducing redundancy and allowing the learner to integrate the concept as the most important step in integration (alignment or temporal coordination) (see document on integration), and d) align learning and assessment experiences to the outcome and the level of achievement specified.

Understanding the competencies table

Understanding the competencies table

A	B	C	D	E	F	G	H	I	J
No.	**Competencies**	**Domain**	**K/KH/SH/P**	**Core**	**Suggested Teaching Learning Method**	**Suggested Assessment method**	**No. required to certify (P)**	**Vertical Integration**	**Horizontal Integration**
Physiology									
Summary **Name of Topic: General Physiology** **Number of Competencies: (08)**									
PY1.1	Describe the structure and functions of a	K	KH	Y	Lectures, Small group discussion	Written/Viva			Biochemistry
IM25.4	Elict *document* and present a medical history that helps delineate the	S	SH	Y	Bed Side clinic, DOAP	Skill assessment		Community Medicine	

Unique number of the competency. First two alphabets represent the subject (see list); number following alphabet reflects topic number, following period is a running number.

Description of competency

Identifies the domain or domains addressed
K - Knowledge
S - Skill
A - Attitude
C - Communication

Identifies the level of competency required based on the Miller's pyramid
K - Knows
KH - Knows How
S - Skill
SH - Show How
P - Perform independently

Identifies if the competency is core or desirable.
Y indicates Core; N-non-core

Identifies the suggested learning method.
DOAP - **D**emonstrate (by Student) Observe, Assist Perform)

Identifies the suggested assessment method
Skill assessment - Clinics, Skills lab, Practicals etc.

no of times a skill needs to be done independently to be certified for independent performance; Rarely used in UG

Subject (s) in other phases with which the competency can be vertically integrated to increase relevance or improve basic understanding

Subject (s) in the same phase with which the competency can be horizontally integrated or aligned to allow a more wholesome understanding

***Numbers given are for illustrative purposes only and should not be compared with the same in curriculum documents**

Deriving learning objectives from competencies

Deriving learning objectives from competencies

K	Knows	A knowledge attribute – Usually enumerates or describes
KH	Knows how	A higher level of knowledge – is able to discuss or analyse
S	Shows	A skill attribute: is able to identify or demonstrate the steps
SH	Shows how	A skill attribute: is able to interpret / demonstrate a complex procedure requiring thought, knowledge and behaviour
P	Performs (under supervision or independently)	Mastery for the level of competence - When done independently under supervision a pre-specified number of times - certification or capacity to perform independently results

Competency: An **observable** ability of a health professional, **integrating multiple components** such as knowledge, skills, values and attitudes.

PA42.3*	**Identify the etiology of meningitis based on given CSF parameters**	**K/S**	**SH**	**Y**

PA42.1*	At the end of the session the **phase II student** must be able to enumerate the most common causes of meningitis correctly
PA42.2*	At the end of the session the **phase II student** must be able to enumerate the components of CSF analysis correctly
PA42.3*	At the end of the session the **phase II student** must be able to **describe** the CSF features for a given etiology of meningitis **accurately**
PA42.4*	At the end of the session the **phase II student** must be able to identify the aetiology of meningitis correctly from a **given set of CSF parameters**

Audience - who will do the behavior

Behavior - What should the learner be able to do?

Condition - Under what conditions should the learner be able to do it?

Degree – How well must it be done

Objective: Statement of what a learner should be able to do at the end of a specific learning experience
***Numbers given are for illustrative purposes only and should not be compared with the same in curriculum documents**

Deriving learning methods from competencies

Deriving learning methods from competencies

Competency: An **observable** ability of a health professional, **integrating multiple components** such as knowledge, skills, values and attitudes.

PA42.3*	**Identify** the etiology of meningitis based on given CSF parameters	K/S	SH	Y

Objective: Statement of what a learner should be able to do at the end of a specific learning experience

PA42.1*	At the end of the session the **Phase II student** must be able to enumerate the most common causes of meningitis **correctly**
PA42.2*	At the end of the session the **Phase II student** must be able to enumerate the components of a CSF analysis correctly
PA42.3*	At the end of the session the **Phase II student** must be able to **describe** the CSF features for a given etiologic of meningitis **accurately**
PA42.4*	At the end of the session the **Phase II student** must the able to identify the aetiology of meningitis correctly from a **given set of CSF parameters**

Lecture or small group discussion

Related objectives can be combined into one teaching session

small group discussion, practical session

*Numbers given are for illustrative purposes only and should not be compared with the same in curriculum documents

Deriving assessment methods from competencies

Deriving assessment methods from competencies-1

Competency: An **observable** ability of a health professional, **integrating multiple components** such as knowledge, skills, values and attitudes.

PA42.3*	**Identify** the etiology of meningitis based on given CSF parameters	K/S	SH	Y

Objective: Statement of what a learner should be able to do at the end of a specific learning experience

PA42.1*	At the end of the session the Phase II student must be able to enumerate the most common causes of meningitis correctly	Short note or part of structured essay: Enumerate 5 causes of meningitis based on their prevalence in India
PA42.2*	At the end of the session the **Phase II student** must be able to enumerate the components of a CSF analysis correctly	Short note or part of structured essay: Enumerate the components tested in a CSF analysis
PA42.3*	At the end of the session the **Phase II student** must be able to **describe** the CSF features for a given aetiology of meningitis a**ccurately**	Short note or part of structured essay: Describe the CSF findings that are characteristic of tuberculous meningitis
PA42.4*	At the end of the session the **Phase II student** must the able to identify the aetiology of meningitis correctly from a **given set of CSF parameters**	Short note / part of the structured essay/ Skill station/ Viva voce Review the CSF findings in the following patient and identify (write or vocalise) the most likely etiology

*** Numbers given are for illustrative purposes only and should not be compared with numbers in the curriculum document**

Deriving assessment methods from competencies-2

Competency: An **observable** ability of a health professional, **integrating multiple components** such as knowledge, skills, values and attitudes.

MI2.4*	List the common microbial agents causing anemia. Describe the morphology, mode of infection and discuss the pathogenesis, clinical course, diagnosis and prevention and treatment of the common microbial agents causing Anemia.	K	KH	Y	Didactic Small group discussion	Written/ Viva voce	Medicine	Pathology

Objective: Statement of what a learner should be able to do at the end of a specific learning experience

MI2.1*	Enumerate the common microbial agents causing anaemia
MI2.2*	Describe the morphology of agent (1,2 etc)
MI2.3*	Describe the mode of infection of agent in humans
MI2.4*	Discuss the pathogenesis of anemia caused by agent
MI2.5*	Describe the clinical course of infection by agent
MI2.6*	Enumerate the diagnostic tests to identify the aetiology of agent as a cause of anemia
MI2.7*	Discuss the methods to prevent infection by agent
MI2.8*	Describe the treatment of infection by agent

Integrate concept - not necessarily teachers
Plan session with teachers of both subjects -teachers from both subjects usually not needed. Ensure redundancy and duplication by reviewing both subjects

Horizontally aligned and integrated with pathology

Vertically integrated with General Medicine

Integrate concept - not necessarily teachers Plan session with teachers from both phases. Make a decision on how much of the information needs to be brought down to this phase to make it relevant. Consider how a competency can ascend over phases: for eg. - can be at a KH -(know how) in phase II but becomes SH in phase III. For vertical integration with clinical subjects, use of a case to link the concept (a well written paper, case is sufficient). Using teachers from both phases is rarely required

The concept of integration

Concept of integration used in the Manual

Integration is a learning experience that allows the learner to perceive relationships from blocks of knowledge and develop a unified view of its basis and its application. The GMR 2018 applies these principles to the extent that will retain the strengths of silo - based education and assessment while providing experiences that will allow learners to integrate concepts.

Keeping this in mind, the Regulations recommend temporal coordination as described by Harden (called alignment in this document) as the major method to be followed allowing similar topics in different subjects to be thought separately but during the same time frame (Figure 1a).

In a small proportion - not to exceed 20% of the total curriculum an attempt can be made to Share (Figure 1b) topics or Correlate (Figure 1c) topics by using an integration session. The integration session most preferred will be a case based discussion in an appropriate format ensuring that elements in the same phase (horizontal) and from other phases are addressed. Care must be taken to ensure that achievement phase - based objectives are given primacy - the integrative elements from other phases are used only to provide adequate recall and understand the clinical application of concepts. It must be emphasized that integration does not necessarily require multiple teachers in each class. Experts from each phase and subject may be involved in the lesson planning but not it in its delivery unless deemed necessary.

As much as possible the necessary correlates from other phases must also be introduced while discussing a topic in a given subject - Nesting (Figure 1d) (Harden). Topics that cannot be aligned and integrated must be provided adequate time in the curriculum throughout the year.

Assessment will continue to be subject based. However, efforts must be made to ensure that phase appropriate correlates are tested to determine if the learner has internalized and integrated the concept and its application.

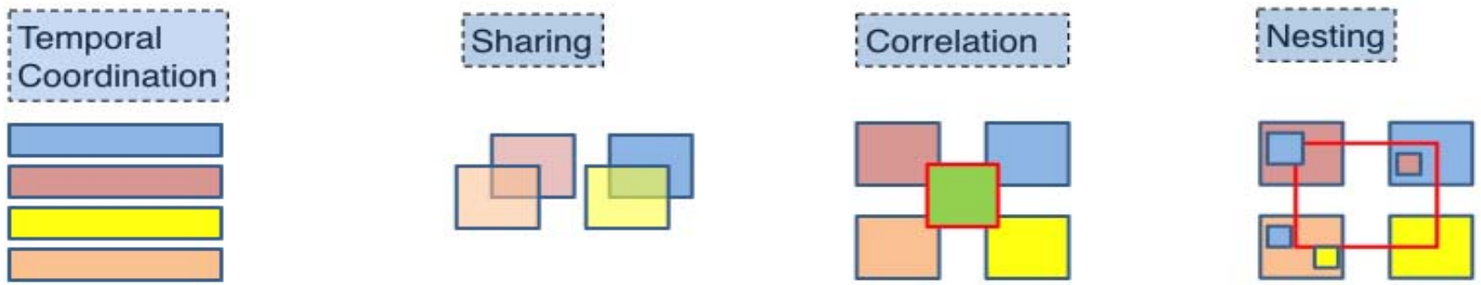

Figure 1 : Integration concepts framed in the GMR. Coloured boxes represent subjects. 1 a. Temporal coordination: The timetable is adjusted so that topics within the subjects or disciplines which are related, are scheduled at the same time. b. Sharing: Two disciplines may agree to plan and jointly implement a teaching program c. Correlation: the emphasis remains on disciplines or subjects with subject-based courses taking up most of the curriculum time. Within this framework, an integrated teaching session or course is introduced in addition to the subject-based teaching (green box with red border) d. Nesting: the teacher targets, within a subject-based course, skills relating to other subjects. Adapted from Harden R Med Edu 2000. 34; 551

Definitions used in the Manual

1. **Goal:** A projected state of affairs that a person or system plans to achieve.

   In other words: Where do you want to go? or What do you want to become?

2. **Competency:** The habitual and judicious use of communication, knowledge, technical skills, clinical reasoning, emotions, values, and reflection in daily practice for the benefit of the individual and community being served.

   In other words: What should you have? or What should have changed?

3. **Objective:** Statement of what a learner should be able to do at the end of a specific learning experience.

   In other words: What the Indian Medical Graduate should know, do, or behave.

Action Verbs used in this manual

Knowledge	**Skill**	**Attitude/communicate**
Enumerate	Identify	Counsel
List	Demonstrate	Inform
Describe	Perform under supervision	Demonstrate understanding of
Discuss	Perform independently	
Differentiate	Document	
Define	Present	
Classify	Record	
Choose	Interpret	
Elicit		
Report		

Note:

1. Specified essential competencies only will be required to be performed independently at the end of the final year MBBS.
2. The word ‘perform’ or ‘do’ is used ONLY if the task has to be done on patients or in laboratory practical in the pre/para- clinical phases.
3. Most tasks that require performance during undergraduate years will be performed under supervision.
4. If a certification to perform independently has been done, then the number of times the task has to be performed under supervision will be indicated in the last column.

Explanation of terms used in this manual

Lecture	Any instructional large group method including traditional lecture and interactive lecture
Small group discussion	Any instructional method involving small groups of students in an appropriate learning context
DOAP (Demonstration-Observation - Assistance - Performance)	A practical session that allows the student to observe a demonstration, assist the performer, perform in a simulated environment, perform under supervision or perform independently
Skill assessment	A session that assesses the skill of the student including those in the practical laboratory, skills lab, skills station that uses mannequins/ paper case/simulated patients/real patients as the context demands
Core	A competency that is necessary in order to complete the requirements of the subject (traditional must know)
Non-Core	A competency that is optional in order to complete the requirements of the subject (traditional nice (good) to know/ desirable to know)
National Guidelines	Health programs as relevant to the competency that are part of the National Health Program

Domains of learning

K	Knowledge
S	Skill
A	Attitude
C	Communication

Levels of competency

K	Knows	A knowledge attribute - Usually enumerates or describes
KH	Knows how	A higher level of knowledge - is able to discuss or analyze
S	Shows	A skill attribute: is able to identify or demonstrate the steps
SH	Shows how	A skill attribute: is able to interpret/ demonstrate a complex procedure requiring thought, knowledge and behavior
P	Performs (under supervision or independently)	Mastery for the level of competence - When done independently under supervision a pre-specified number of times - certification or capacity to perform independently results

Note:

In the table of competency - the highest level of competency acquired is specified and implies that the lower levels have been acquired already. Therefore, when a student is able to SH - Show how - an informed consent is obtained - it is presumed that the preceding steps - the knowledge, the analytical skills, the skill of communicating have all been obtained.

It may also be noted that attainment of the highest level of competency may be obtained through steps spread over several subjects or phases and not necessarily in the subject or the phase in which the competency has been identified.

Volume I

Competency based Undergraduate Curriculum

in

Pre-clinical and Para-clinical subjects

HUMAN ANATOMY (CODE: AN)

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
Human Anatomy									
Topic: Anatomical terminology		**Number of competencies: (2)**				**Number of procedures for certification: (NIL)**			
AN1.1	Demonstrate normal anatomical position, various planes, relation, comparison, laterality & movement in our body	K/S	SH	Y	Lecture, DOAP session	Written/ Viva voce/skills assessment			
AN1.2	Describe composition of bone and bone marrow	K	KH	Y	Lecture	Written/ Viva voce			
Topic: General features of bones & Joints		**Number of competencies: (6)**				**Number of procedures for certification: (NIL)**			
AN2.1	Describe parts, blood and nerve supply of a long bone	K	KH	Y	Lecture, DOAP session	Written/ Viva voce			
AN2.2	Enumerate laws of ossification	K	KH	N	Lecture	Written			
AN2.3	Enumerate special features of a sesamoid bone	K	KH	N	Lecture	Written			
AN2.4	Describe various types of cartilage with its structure & distribution in body	K	KH	Y	Lecture	Written/ Viva voce		Orthopedics	
AN2.5	Describe various joints with subtypes and examples	K	KH	Y	Lecture	Written/ Viva voce		Orthopedics	
AN2.6	Explain the concept of nerve supply of joints & Hilton's law	K	KH	Y	Lecture	Written/ Viva voce			
Topic: General features of Muscle		**Number of competencies: (3)**				**Number of procedures for certification: (NIL)**			
AN3.1	Classify muscle tissue according to structure & action	K	KH	Y	Lecture	Written/ Viva voce			Physiology
AN3.2	Enumerate parts of skeletal muscle and differentiate between tendons and aponeuroses with examples	K	KH	Y	Lecture	Written/ Viva voce			
AN3.3	Explain Shunt and spurt muscles	K	KH	N	Lecture	Written			
Topic: General features of skin and fascia		**Number of competencies: (5)**				**Number of procedures for certification: (NIL)**			
AN4.1	Describe different types of skin & dermatomes in body	K	KH	N	Lecture, DOAP session	Written			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN4.2	Describe structure & function of skin with its appendages	K	KH	Y	Lecture, DOAP session	Written/ Viva voce		Dermatology, Venereology & Leprosy	
AN4.3	Describe superficial fascia along with fat distribution in body	K	KH	Y	Lecture, DOAP session	Written/ Viva voce			
AN4.4	Describe modifications of deep fascia with its functions	K	KH	Y	Lecture, DOAP session	Written/ Viva voce		Dermatology, Venereology & Leprosy	
AN4.5	Explain principles of skin incisions	K	KH	N	Lecture	Written		Dermatology, Venereology & Leprosy	
Topic: General features of the cardiovascular system		**Number of competencies: (8)**				**Number of procedures for certification: (NIL)**			
AN5.1	Differentiate between blood vascular and lymphatic system	K	KH	Y	Lecture	Written/ Viva voce			Physiology
AN5.2	Differentiate between pulmonary and systemic circulation	K	KH	Y	Lecture	Written/ Viva voce			Physiology
AN5.3	List general differences between arteries & veins	K	KH	Y	Lecture	Written/ Viva voce			
AN5.4	Explain functional difference between elastic, muscular arteries and arterioles	K	KH	Y	Lecture	Written/ Viva voce			
AN5.5	Describe portal system giving examples	K	KH	Y	Lecture	Written/ Viva voce			
AN5.6	Describe the concept of anastomoses and collateral circulation with significance of end-arteries	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Physiology
AN5.7	Explain function of meta-arterioles, precapillary sphincters, arterio-venous anastomoses	K	KH	N	Lecture	Written			Physiology
AN5.8	Define thrombosis, infarction & aneurysm	K	KH	N	Lecture	Written		Pathology	Physiology
Topic: General Features of lymphatic system		**Number of competencies: (3)**				**Number of procedures for certification: (NIL)**			
AN6.1	List the components and functions of the lymphatic system	K	KH	N	Lecture	Written			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN6.2	Describe structure of lymph capillaries & mechanism of lymph circulation	K	KH	N	Lecture	Written			
AN6.3	Explain the concept of lymphoedema and spread of tumors via lymphatics and venous system	K	KH	N	Lecture	Written		General Surgery	
Topic: Introduction to the nervous system		**Number of competencies: (8)**				**Number of procedures for certification: (NIL)**			
AN7.1	Describe general plan of nervous system with components of central, peripheral & autonomic nervous systems	K	KH	Y	Lecture	Written			
AN7.2	List components of nervous tissue and their functions	K	KH	Y	Lecture	Written/ Viva voce			Physiology
AN7.3	Describe parts of a neuron and classify them based on number of neurites, size & function	K	KH	Y	Lecture	Written/ Viva voce			Physiology
AN7.4	Describe structure of a typical spinal nerve	K	KH	Y	Lecture	Written/ Viva voce			
AN7.5	Describe principles of sensory and motor innervation of muscles	K	KH	N	Lecture	Written		General Medicine	Physiology
AN7.6	Describe concept of loss of innervation of a muscle with its applied anatomy	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	
AN7.7	Describe various type of synapse	K	KH	N	Lecture	Written			Physiology
AN7.8	Describe differences between sympathetic and spinal ganglia	K	KH	N	Lecture	Written			
Topic: Features of individual bones (Upper Limb)		**Number of competencies: (6)**				**Number of procedures for certification: (NIL)**			
AN8.1	Identify the given bone, its side, important features & keep it in anatomical position	K/S	SH	Y	DOAP session	Viva voce/ Practicals/ OSPE			
AN8.2	Identify & describe joints formed by the given bone	K/S	SH	Y	Lecture, DOAP session	Viva voce			
AN8.3	Enumerate peculiarities of clavicle	K	KH	Y	Lecture, DOAP session	Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN8.4	Demonstrate important muscle attachment on the given bone	K/S	SH	Y	Practical DOAP session, Small group teaching	Viva voce Practicals		Orthopedics	
AN8.5	Identify and name various bones in articulated hand, Specify the parts of metacarpals and phalanges and enumerate the peculiarities of pisiform	K/S	SH	Y	Practical,F91 DOAP session, Small group teaching	Viva voce Practicals			
AN8.6	Describe scaphoid fracture and explain the anatomical basis of avascular necrosis	K	KH	N	DOAP session	Viva voce		Orthopedics	
Topic: Pectoral region		**Number of competencies: (3)**				**Number of procedures for certification: (NIL)**			
AN9.1	Describe attachment, nerve supply & action of pectoralis major and pectoralis minor	K	KH	Y	Lecture, Practical	Written			
AN9.2	Breast: Describe the location, extent, deep relations, structure, age changes, blood supply, lymphatic drainage, microanatomy and applied anatomy of breast	K	KH	Y	Practical, Lecture	Written/ Viva voce		General Surgery	
AN9.3	Describe development of breast	K	KH	N	Lecture	Written			
Topic: Axilla, Shoulder and Scapular region		**Number of competencies: (13)**				**Number of procedures for certification: (NIL)**			
AN10.1	Identify & describe boundaries and contents of axilla	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN10.2	Identify, describe and demonstrate the origin, extent, course, parts, relations and branches of axillary artery & tributaries of vein	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN10.3	Describe, identify and demonstrate formation, branches, relations, area of supply of branches, course and relations of terminal branches of brachial plexus	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN10.4	Describe the anatomical groups of axillary lymph nodes and specify their areas of drainage	K	KH	Y	Practical, Lecture	Written/ Viva voce		General Surgery	
AN10.5	Explain variations in formation of brachial plexus	K	KH	Y	Practical, Lecture	Written/ Viva voce			
AN10.6	Explain the anatomical basis of clinical features of Erb's palsy and Klumpke's paralysis	K	KH	N	Lecture	Written		General Surgery	
AN10.7	Explain anatomical basis of enlarged axillary lymph nodes	K	KH	N	Lecture	Written		General Surgery	
AN10.8	Describe, identify and demonstrate the position, attachment, nerve supply and actions of trapezius and latissimus dorsi	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN10.9	Describe the arterial anastomosis around the scapula and mention the boundaries of triangle of auscultation	K	KH	N	Lecture	Written			
AN10.10	Describe and identify the deltoid and rotator cuff muscles	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN10.11	Describe & demonstrate attachment of serratus anterior with its action	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN10.12	Describe and demonstrate shoulder joint for– type, articular surfaces, capsule, synovial membrane, ligaments, relations, movements, muscles involved, blood supply, nerve supply and applied anatomy	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		Orthopedics	
AN10.13	Explain anatomical basis of Injury to axillary nerve during intramuscular injections	K	KH	N	Lecture	Viva voce			
Topic: Arm & Cubital fossa		**Number of competencies: (6)**				**Number of procedures for certification: (NIL)**			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN11.1	Describe and demonstrate muscle groups of upper arm with emphasis on biceps and triceps brachii	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN11.2	Identify & describe origin, course, relations, branches (or tributaries), termination of important nerves and vessels in arm	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN11.3	Describe the anatomical basis of Venepuncture of cubital veins	K	KH	Y	Practical, Lecture	Written/ Viva voce		General Surgery	
AN11.4	Describe the anatomical basis of Saturday night paralysis	K	KH	Y	Practical, Lecture	Written/ Viva voce		Orthopedics	
AN11.5	Identify & describe boundaries and contents of cubital fossa	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN11.6	Describe the anastomosis around the elbow joint	K	KH	N	Lecture	Written			
Topic: Forearm & hand		**Number of competencies: (15)**				**Number of procedures for certification: (NIL)**			
AN12.1	Describe and demonstrate important muscle groups of ventral forearm with attachments, nerve supply and actions	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN12.2	Identify & describe origin, course, relations, branches (or tributaries), termination of important nerves and vessels of forearm	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN12.3	Identify & describe flexor retinaculum with its attachments	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN12.4	Explain anatomical basis of carpal tunnel syndrome	K	KH	Y	Lecture	Written/ Viva voce			
AN12.5	Identify & describe small muscles of hand. Also describe movements of thumb and muscles involved	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN12.6	Describe & demonstrate movements of thumb and muscles involved	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN12.7	Identify & describe course and branches of important blood vessels and nerves in hand	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN12.8	Describe anatomical basis of Claw hand	K	KH	Y	Lecture	Written/ Viva voce		General Surgery	
AN12.9	Identify & describe fibrous flexor sheaths, ulnar bursa, radial bursa and digital synovial sheaths	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN12.10	Explain infection of fascial spaces of palm	K	KH	N	Lecture	Written		General Surgery	
AN12.11	Identify, describe and demonstrate important muscle groups of dorsal forearm with attachments, nerve supply and actions	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN12.12	Identify & describe origin, course, relations, branches (or tributaries), termination of important nerves and vessels of back of forearm	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN12.13	Describe the anatomical basis of Wrist drop	K	KH	Y	Lecture	Written/ Viva voce		General Surgery	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN12.14	Identify & describe compartments deep to extensor retinaculum	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN12.15	Identify & describe extensor expansion formation	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
Topic: General Features, Joints, radiographs & surface marking		**Number of competencies: (8)**				**Number of procedures for certification: (NIL)**			
AN13.1	Describe and explain Fascia of upper limb and compartments, veins of upper limb and its lymphatic drainage	K	KH	Y	Lecture	Written/ Viva voce			
AN13.2	Describe dermatomes of upper limb	K	KH	N	Lecture	Written/ Viva voce			
AN13.3	Identify & describe the type, articular surfaces, capsule, synovial membrane, ligaments, relations, movements, blood and nerve supply of elbow joint, proximal and distal radio-ulnar joints, wrist joint & first carpometacarpal joint	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN13.4	Describe Sternoclavicular joint, Acromioclavicular joint, Carpometacarpal joints & Metacarpophalangeal joint	K	KH	N	Lecture	Written			
AN13.5	Identify the bones and joints of upper limb seen in anteroposterior and lateral view radiographs of shoulder region, arm, elbow, forearm and hand	K/S	SH	Y	Practical, Small group discussion, DOAP session	Viva voce/ skill assessment		Radiodiagnosis	
AN13.6	Identify & demonstrate important bony landmarks of upper limb: Jugular notch, sternal angle, acromial angle, spine of the scapula, vertebral level of the medial end, Inferior angle of the scapula	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Viva voce/ skill assessment			
AN13.7	Identify & demonstrate surface projection of: Cephalic and basilic vein, Palpation of Brachial artery, Radial artery, Testing of muscles: Trapezius, pectoralis major, serratus anterior, latissimus dorsi, deltoid, biceps brachii, Brachioradialis	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Viva voce/ skill assessment			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN13.8	Describe development of upper limb	K	KH	N	Lecture	Written			
Features of individual bones (Lower Limb)		**Number of competencies: (4)**				**Number of procedures for certification: (NIL)**			
AN14.1	Identify the given bone, its side, important features & keep it in anatomical position	K/S	SH	Y	DOAP session	Viva voce			
AN14.2	Identify & describe joints formed by the given bone	K/S	SH	Y	Lecture, DOAP session	Viva voce			
AN14.3	Describe the importance of ossification of lower end of femur & upper end of tibia	K	KH	Y	Lecture	Viva voce/ Practicals		Forensic Medicine & Toxicology	
AN14.4	Identify and name various bones in the articulated foot with individual muscle attachment	K/S	SH	N	Practical, DOAP session, Small group teaching	Viva voce/ Practicals			
Topic: Front & Medial side of thigh		**Number of competencies: (5) ♂**				**Number of procedures for certification: (NIL)**			
AN15.1	Describe and demonstrate origin, course, relations, branches (or tributaries), termination of important nerves and vessels of anterior thigh	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN15.2	Describe and demonstrate major muscles with their attachment, nerve supply and actions	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN15.3	Describe and demonstrate boundaries, floor, roof and contents of femoral triangle	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN15.4	Explain anatomical basis of Psoas abscess & Femoral hernia	K	KH	N	Lecture, DOAP session	Written/ Viva voce		General Surgery	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN15.5	Describe and demonstrate adductor canal with its content	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
Topic: Gluteal region & back of thigh		**Number of competencies: (6)**				**Number of procedures for certification: (NIL)**			
AN16.1	Describe and demonstrate origin, course, relations, branches (or tributaries), termination of important nerves and vessels of gluteal region	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN16.2	Describe anatomical basis of sciatic nerve injury during gluteal intramuscular injections	K	KH	Y	Lecture, DOAP session	Written/ Viva voce		General Surgery	
AN16.3	Explain the anatomical basis of Trendelenburg sign	K	KH	Y	Lecture, DOAP session	Written/ Viva voce		General Surgery	
AN16.4	Describe and demonstrate the hamstrings group of muscles with their attachment, nerve supply and actions	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN16.5	Describe and demonstrate the origin, course, relations, branches (or tributaries), termination of important nerves and vessels on the back of thigh	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN16.6	Describe and demonstrate the boundaries, roof, floor, contents and relations of popliteal fossa	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
Topic: Hip Joint		**Number of competencies: (3)**				**Number of procedures for certification: (NIL)**			
AN17.1	Describe and demonstrate the type, articular surfaces, capsule, synovial membrane, ligaments, relations, movements and muscles involved, blood and nerve supply, bursae around the hip joint	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN17.2	Describe anatomical basis of complications of fracture neck of femur	K	KH	N	Lecture	Written/ Viva voce		Orthopedics	
AN17.3	Describe dislocation of hip joint and surgical hip replacement	K	KH	N	Lecture	Written/ Viva voce		Orthopedics	
Topic: Knee joint, Anterolateral compartment of leg & dorsum of foot		**Number of competencies: (7) ♂**				**Number of procedures for certification: (NIL)**			
AN18.1	Describe and demonstrate major muscles of anterolateral compartment of leg with their attachment, nerve supply and actions	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN18.2	Describe and demonstrate origin, course, relations, branches (or tributaries), termination of important nerves and vessels of anterior compartment of leg	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN18.3	Explain the anatomical basis of foot drop	K	KH	Y	Lecture, DOAP session	Written/ Viva voce		General Surgery	
AN18.4	Describe and demonstrate the type, articular surfaces, capsule, synovial membrane, ligaments, relations, movements and muscles involved, blood and nerve supply, bursae around the knee joint	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN18.5	Explain the anatomical basis of locking and unlocking of the knee joint	K	KH	Y	Small group teaching	Written/ Viva voce			
AN18.6	Describe knee joint injuries with its applied anatomy	K	KH	N	Lecture	Written/ Viva voce		Orthopedics	
AN18.7	Explain anatomical basis of Osteoarthritis	K	KH	N	Lecture	Written/ Viva voce		Orthopedics	
Topic: Back of Leg & Sole		**Number of competencies: (7)**				**Number of procedures for certification: (NIL)**			
AN19.1	Describe and demonstrate the major muscles of back of leg with their attachment, nerve supply and actions	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN19.2	Describe and demonstrate the origin, course, relations, branches (or tributaries), termination of important nerves and vessels of back of leg	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN19.3	Explain the concept of “Peripheral heart”	K	KH	Y	Lecture	Written/ Viva voce		General Surgery	
AN19.4	Explain the anatomical basis of rupture of calcaneal tendon	K	KH	N	Lecture	Written/ Viva voce		Orthopedics	
AN19.5	Describe factors maintaining importance arches of the foot with its importance	K	KH	Y	Lecture	Written/ Viva voce			
AN19.6	Explain the anatomical basis of Flat foot & Club foot	K	KH	N	Lecture	Written/ Viva voce		Orthopedics	
AN19.7	Explain the anatomical basis of Metatarsalgia & Plantar fasciitis	K	KH	N	Lecture	Written/ Viva voce		Orthopedics	
Topic: General Features, Joints, radiographs & surface marking **Number of competencies: (10)** **Number of procedures for certification: (NIL)**									
AN20.1	Describe and demonstrate the type, articular surfaces, capsule, synovial membrane, ligaments, relations, movements and muscles involved, blood and nerve supply of tibiofibular and ankle joint	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN20.2	Describe the subtalar and transverse tarsal joints	K	KH	N	Lecture, DOAP session	Written/ Viva voce			
AN20.3	Describe and demonstrate Fascia lata, Venous drainage, Lymphatic drainage, Retinacula & Dermatomes of lower limb	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN20.4	Explain anatomical basis of enlarged inguinal lymph nodes	K	KH	N	Lecture	Written/ Viva voce		General Surgery	
AN20.5	Explain anatomical basis of varicose veins and deep vein thrombosis	K	KH	Y	Lecture	Written/ Viva voce		General Surgery	
AN20.6	Identify the bones and joints of lower limb seen in anteroposterior and lateral view radiographs of various regions of lower limb	K/S	SH	Y	Lecture, Small group discussion, DOAP session	Viva voce/ skill assessment		Radiodiagnosis	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN20.7	Identify & demonstrate important bony landmarks of lower limb: -Vertebral levels of highest point of iliac crest, posterior superior iliac spines, iliac tubercle, pubic tubercle, ischial tuberosity, adductor tubercle, -Tibial tuberosity, head of fibula, -Medial and lateral malleoli, Condyles of femur and tibia, sustentaculum tali, tuberosity of fifth metatarsal, tuberosity of the navicular	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Viva voce/ skill assessment			
AN20.8	Identify & demonstrate palpation of femoral, popliteal, post tibial, anti tibial & dorsalis pedis blood vessels in a simulated environment	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Viva voce/ skill assessment		General Medicine	
AN20.9	Identify & demonstrate Palpation of vessels (femoral, popliteal,dorsalis pedis,post tibial), Mid inguinal point, Surface projection of: femoral nerve, Saphenous opening, Sciatic, tibial, common peroneal & deep peroneal nerve, Great and small saphenous veins	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Viva voce/ skill assessment		General Medicine, General Surgery	
AN20.10	Describe basic concept of development of lower limb	K	KH	N	Lecture	Viva voce			
Topic: Thoracic cage		**Number of competencies: (11)**				**Number of procedures for certification: (NIL)**			
AN21.1	Identify and describe the salient features of sternum, typical rib, Ist rib and typical thoracic vertebra	K/S	SH	Y	Lecture, DOAP session	Viva voce/ skill assessment			
AN21.2	Identify & describe the features of 2nd, 11th and 12th ribs, 1st, 11th and 12th thoracic vertebrae	K/S	SH	N	Lecture, DOAP session	Viva voce/ skill assessment			
AN21.3	Describe & demonstrate the boundaries of thoracic inlet, cavity and outlet	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN21.4	Describe & demonstrate extent, attachments, direction of fibres, nerve supply and actions of intercostal muscles	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN21.5	Describe & demonstrate origin, course, relations and branches of a typical intercostal nerve	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN21.6	Mention origin, course and branches/ tributaries of: 1) anterior & posterior intercostal vessels 2) internal thoracic vessels	K	KH	Y	Practical, Lecture	Written/ Viva voce			
AN21.7	Mention the origin, course, relations and branches of 1) atypical intercostal nerve 2) superior intercostal artery, subcostal artery	K	KH	N	Lecture	Written			
AN21.8	Describe & demonstrate type, articular surfaces & movements of manubriosternal, costovertebral, costotransverse and xiphisternal joints	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN21.9	Describe & demonstrate mechanics and types of respiration	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			Physiology
AN21.10	Describe costochondral and interchondral joints	K	KH	N	Lecture	Written			
AN21.11	Mention boundaries and contents of the superior, anterior, middle and posterior mediastinum	K	KH	Y	Practical, Lecture	Written/ Viva voce			
Topic: Heart & Pericardium		**Number of competencies: (7)**				**Number of procedures for certification: (NIL)**			
AN22.1	Describe & demonstrate subdivisions, sinuses in pericardium, blood supply and nerve supply of pericardium	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN22.2	Describe & demonstrate external and internal features of each chamber of heart	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			Physiology
AN22.3	Describe & demonstrate origin, course and branches of coronary arteries	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			Physiology

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN22.4	Describe anatomical basis of ischaemic heart disease	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Physiology
AN22.5	Describe & demonstrate the formation, course, tributaries and termination of coronary sinus	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN22.6	Describe the fibrous skeleton of heart	K	KH	Y	Lecture	Written			
AN22.7	Mention the parts, position and arterial supply of the conducting system of heart	K	KH	Y	Lecture	Written		General Medicine	Physiology
Topic: Mediastinum		**Number of competencies: (7)**				**Number of procedures for certification: (NIL)**			
AN23.1	Describe & demonstrate the external appearance, relations, blood supply, nerve supply,lymphatic drainage and applied anatomy of oesophagus	K/S	SH	Y	Practical, Lecture, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN23.2	Describe & demonstrate the extent, relations tributaries of thoracic duct and enumerate its applied anatomy	K/S	SH	Y	Practical, Lecture, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN23.3	Describe & demonstrate origin, course, relations, tributaries and termination of superior venacava, azygos, hemiazygos and accessory hemiazygos veins	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN23.4	Mention the extent, branches and relations of arch of aorta & descending thoracic aorta	K	KH	Y	Practical, Lecture	Written/ Viva voce			
AN23.5	Identify & Mention the location and extent of thoracic sympathetic chain	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN23.6	Describe the splanchnic nerves	K	KH	N	Lecture	Written			
AN23.7	Mention the extent, relations and applied anatomy of lymphatic duct	K	KH	Y	Lecture	Written/ Viva voce		General Surgery	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
Topic: Lungs & Trachea		**Number of competencies: (6)**				**Number of procedures for certification: (NIL)**			
AN24.1	Mention the blood supply, lymphatic drainage and nerve supply of pleura, extent of pleura and describe the pleural recesses and their applied anatomy	K	KH	Y	Practical, Lecture	Written/ Viva voce		General Medicine	Physiology
AN24.2	Identify side, external features and relations of structures which form root of lung & bronchial tree and their clinical correlate	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Medicine	Physiology
AN24.3	Describe a bronchopulmonary segment	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Physiology
AN24.4	Identify phrenic nerve & describe its formation & distribution	K/S	SH	Y	Lecture, Practical	Written/ Viva voce			
AN24.5	Mention the blood supply, lymphatic drainage and nerve supply of lungs	K	KH	Y	Lecture	Written/ Viva voce			
AN24.6	Describe the extent, length, relations, blood supply, lymphatic drainage and nerve supply of trachea	K	KH	N	Lecture	Written			
Topic: Thorax		**Number of competencies: (9)**				**Number of procedures for certification: (01)**			
AN25.1	Identify, draw and label a slide of trachea and lung	K/S	SH	Y	Lecture, Practical	Written/ skill assessment	1		
AN25.2	Describe development of pleura, lung & heart	K	KH	Y	Lecture	Written			
AN25.3	Describe fetal circulation and changes occurring at birth	K	KH	Y	Lecture	Written		General Medicine	Physiology
AN25.4	Describe embryological basis of: 1) atrial septal defect, 2) ventricular septal defect, 3) Fallot's tetralogy & 4) tracheo-oesophageal fistula	K	KH	Y	Lecture	Written/ Viva voce		General Medicine, Pediatrics	Physiology

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN25.5	Describe developmental basis of congenital anomalies, transposition of great vessels, dextrocardia, patent ductus arteriosus and coarctation of aorta	K	KH	Y	Lecture	Written/ Viva voce		General Medicine, Pediatrics	Physiology
AN25.6	Mention development of aortic arch arteries, SVC, IVC and coronary sinus	K	KH	N	Lecture	Written/ Viva voce			
AN25.7	Identify structures seen on a plain x-ray chest (PA view)	K/S	SH	Y	Practical, DOAP session	Written/ Viva voce		Radiodiagnosis, General Medicine	
AN25.8	Identify and describe in brief a barium swallow	K/S	SH	N	Practical, DOAP session	Written/ Viva voce		Radiodiagnosis, General Medicine	
AN25.9	Demonstrate surface marking of lines of pleural reflection, lung borders and fissures, trachea, heart borders, apex beat & surface projection of valves of heart	K/S	SH	Y	Practical	Viva voce/ skill assessment		General Medicine, Pediatrics	Physiology
Topic: Skull osteology		**Number of competencies: (7)**				**Number of procedures for certification: (NIL)**			
AN26.1	Demonstrate anatomical position of skull, Identify and locate individual skull bones in skull	K/S	SH	Y	Lecture, DOAP session	Viva voce/ skill assessment			
AN26.2	Describe the features of norma frontalis, verticalis, occipitalis, lateralis and basalis	K/S	SH	Y	Lecture, DOAP session	Viva voce/ skill assessment			
AN26.3	Describe cranial cavity, its subdivisions, foramina and structures passing through them	K/S	SH	Y	Lecture, DOAP session	Viva voce/ skill assessment			
AN26.4	Describe morphological features of mandible	K/S	SH	Y	Lecture, DOAP session	Viva voce/ skill assessment			
AN26.5	Describe features of typical and atypical cervical vertebrae (atlas and axis)	K/S	SH	Y	Lecture, DOAP session	Viva voce/ skill assessment			
AN26.6	Explain the concept of bones that ossify in membrane	K	KH	N	Lecture	Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN26.7	Describe the features of the 7th cervical vertebra	K/S	SH	N	DOAP session	Viva voce			
Topic: Scalp		**Number of competencies: (2)**				**Number of procedures for certification: (NIL)**			
AN27.1	Describe the layers of scalp, its blood supply, its nerve supply and surgical importance	K	KH	Y	Practical, Lecture	Written/ Viva voce		General Surgery	
AN27.2	Describe emissary veins with its role in spread of infection from extracranial route to intracranial venous sinuses	K	KH	Y	Lecture	Written			
Topic: Face & parotid region		**Number of competencies: (10)**				**Number of procedures for certification: (NIL)**			
AN28.1	Describe & demonstrate muscles of facial expression and their nerve supply	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN28.2	Describe sensory innervation of face	K	KH	Y	Practical, Lecture	Written/ Viva voce			
AN28.3	Describe & demonstrate origin /formation, course, branches /tributaries of facial vessels	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN28.4	Describe & demonstrate branches of facial nerve with distribution	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN28.5	Describe cervical lymph nodes and lymphatic drainage of head, face and neck	K	KH	Y	Practical, Lecture	Written/ Viva voce			
AN28.6	Identify superficial muscles of face, their nerve supply and actions	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN28.7	Explain the anatomical basis of facial nerve palsy	K	KH	Y	Lecture	Written		General Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN28.8	Explain surgical importance of deep facial vein	K	KH	Y	Lecture	Written		General Surgery	
AN28.9	Describe & demonstrate the parts, borders, surfaces, contents, relations and nerve supply of parotid gland with course of its duct and surgical importance	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN28.10	Explain the anatomical basis of Frey's syndrome	K	KH	N	Lecture	Written		General Surgery	
Topic: Posterior triangle of neck		**Number of competencies: (4)**				**Number of procedures for certification: (NIL)**			
AN29.1	Describe & demonstrate attachments, nerve supply, relations and actions of sternocleidomastoid	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN29.2	Explain anatomical basis of Erb's & Klumpke's palsy	K	KH	Y	Lecture	Written		General Surgery	
AN29.3	Explain anatomical basis of wry neck	K	KH	N	Lecture	Written		General Surgery	
AN29.4	Describe & demonstrate attachments of 1) inferior belly of omohyoid, 2)scalenus anterior, 3) scalenus medius & 4) levator scapulae	K/S	SH	N	Lecture, Practical	Written/ Viva voce			
Topic: Cranial cavity		**Number of competencies: (5)**				**Number of procedures for certification: (NIL)**			
AN30.1	Describe the cranial fossae & identify related structures	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN30.2	Describe & identify major foramina with structures passing through them	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN30.3	Describe & identify dural folds & dural venous sinuses	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN30.4	Describe clinical importance of dural venous sinuses	K	KH	Y	Lecture	Written			
AN30.5	Explain effect of pituitary tumours on visual pathway	K	KH	N	Lecture	Written		Ophthalmology	
Topic: Orbit		**Number of competencies: (5)**			**Number of procedures for certification: (NIL)**				
AN31.1	Describe & identify extra ocular muscles of eyeball	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN31.2	Describe & demonstrate nerves and vessels in the orbit	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN31.3	Describe anatomical basis of Horner's syndrome	K	KH	N	Lecture	Written		Ophthalmology	
AN31.4	Enumerate components of lacrimal apparatus	K	KH	Y	Lecture	Written			
AN31.5	Explain the anatomical basis of oculomotor, trochlear and abducent nerve palsies along with strabismus	K	KH	Y	Lecture	Written		Ophthalmology	
Topic: Anterior Triangle		**Number of competencies: (2)**			**Number of procedures for certification: (NIL)**				
AN32.1	Describe boundaries and subdivisions of anterior triangle	K	KH	Y	Practical, Lecture	Written/ Viva voce			
AN32.2	Describe & demonstrate boundaries and contents of muscular, carotid, digastric and submental triangles	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
Topic: Temporal and Infratemporal regions		**Number of competencies: (5)**			**Number of procedures for certification: (NIL)**				
AN33.1	Describe & demonstrate extent, boundaries and contents of temporal and infratemporal fossae	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN33.2	Describe & demonstrate attachments, direction of fibres, nerve supply and actions of muscles of mastication	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN33.3	Describe & demonstrate articulating surface, type & movements of temporomandibular joint	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN33.4	Explain the clinical significance of pterygoid venous plexus	K	KH	Y	Lecture	Written		General Surgery	
AN33.5	Describe the features of dislocation of temporomandibular joint	K	KH	N	Lecture	Written		General Surgery	
Topic: Submandibular region		**Number of competencies: (2)**				**Number of procedures for certification: (NIL)**			
AN34.1	Describe & demonstrate the morphology, relations and nerve supply of submandibular salivary gland & submandibular ganglion	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN34.2	Describe the basis of formation of submandibular stones	K	KH	N	Lecture	Written		General Surgery	
Topic: Deep structures in the neck		**Number of competencies: (10)**				**Number of procedures for certification: (NIL)**			
AN35.1	Describe the parts, extent, attachments, modifications of deep cervical fascia	K	KH	Y	Lecture	Written			
AN35.2	Describe & demonstrate location, parts, borders, surfaces, relations & blood supply of thyroid gland	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN35.3	Demonstrate & describe the origin, parts, course & branches subclavian artery	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN35.4	Describe & demonstrate origin, course, relations, tributaries and termination of internal jugular & brachiocephalic veins	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN35.5	Describe and demonstrate extent, drainage & applied anatomy of cervical lymph nodes	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN35.6	Describe and demonstrate the extent, formation, relation & branches of cervical sympathetic chain	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN35.7	Describe the course and branches of IX, X, XI & XII nerve in the neck	K	KH	Y	Lecture	Written			
AN35.8	Describe the anatomically relevant clinical features of Thyroid swellings	K	KH	N	Lecture	Written		General Surgery	
AN35.9	Describe the clinical features of compression of subclavian artery and lower trunk of brachial plexus by cervical rib	K	KH	N	Lecture	Written		General Surgery	
AN35.10	Describe the fascial spaces of neck	K	KH	N	Lecture	Written			
Topic: Mouth, Pharynx & Palate		**Number of competencies: (5)**				**Number of procedures for certification: (NIL)**			
AN36.1	Describe the 1) morphology, relations, blood supply and applied anatomy of palatine tonsil 2) composition of soft palate	K	KH	Y	Lecture	Written		ENT	
AN36.2	Describe the components and functions of Waldeyer's lymphatic ring	K	KH	Y	Lecture	Written		ENT	
AN36.3	Describe the boundaries and clinical significance of pyriform fossa	K	KH	N	Lecture	Written		ENT	
AN36.4	Describe the anatomical basis of tonsillitis, tonsillectomy, adenoids and peri-tonsillar abscess	K	KH	N	Lecture	Written		ENT	
AN36.5	Describe the clinical significance of Killian's dehiscence	K	KH	N	Lecture	Written		ENT	
Topic: Cavity of Nose		**Number of competencies: (3)**				**Number of procedures for certification: (NIL)**			
AN37.1	Describe & demonstrate features of nasal septum, lateral wall of nose, their blood supply and nerve supply	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		ENT	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN37.2	Describe location and functional anatomy of paranasal sinuses	K	KH	Y	Lecture	Written		ENT	
AN37.3	Describe anatomical basis of sinusitis & maxillary sinus tumours	K	KH	N	Lecture	Written		ENT	
Topic: Larynx		**Number of competencies: (3)**				**Number of procedures for certification: (NIL)**			
AN38.1	Describe the morphology, identify structure of the wall, nerve supply, blood supply and actions of intrinsic and extrinsic muscles of the larynx	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		ENT	
AN38.2	Describe the anatomical aspects of laryngitis	K	KH	N	Lecture	Written		ENT	
AN38.3	Describe anatomical basis of recurrent laryngeal nerve injury	K	KH	N	Lecture	Written		ENT	
Topic: Tongue		**Number of competencies: (2)**				**Number of procedures for certification: (NIL)**			
AN39.1	Describe & demonstrate the morphology, nerve supply, embryological basis of nerve supply, blood supply, lymphatic drainage and actions of extrinsic and intrinsic muscles of tongue	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN39.2	Explain the anatomical basis of hypoglossal nerve palsy	K	KH	N	Lecture	Written		ENT	
Topic: Organs of hearing and equilibrium		**Number of competencies: (5)**				**Number of procedures for certification: (NIL)**			
AN40.1	Describe & identify the parts, blood supply and nerve supply of external ear	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		ENT	
AN40.2	Describe & demonstrate the boundaries, contents, relations and functional anatomy of middle ear and auditory tube	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		ENT	
AN40.3	Describe the features of internal ear	K	KH	N	Lecture	Written		ENT	
AN40.4	Explain anatomical basis of otitis externa and otitis media	K	KH	N	Lecture	Written		ENT	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN40.5	Explain anatomical basis of myringotomy	K	KH	N	Lecture	Written		ENT	
Topic: Eyeball		**Number of competencies: (3)**			**Number of procedures for certification: (NIL)**				
AN41.1	Describe & demonstrate parts and layers of eyeball	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		Ophthalmology	
AN41.2	Describe the anatomical aspects of cataract, glaucoma & central retinal artery occlusion	K	KH	N	Lecture	Written		Ophthalmology	
AN41.3	Describe the position, nerve supply and actions of intraocular muscles	K	KH	N	Lecture	Written		Ophthalmology	
Topic: Back Region		**Number of competencies: (3)**			**Number of procedures for certification: (NIL)**				
AN42.1	Describe the contents of the vertebral canal	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN42.2	Describe & demonstrate the boundaries and contents of Suboccipital triangle	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN42.3	Describe the position, direction of fibres, relations, nerve supply, actions of semispinalis capitis and splenius capitis	K	KH	N	Lecture	Written			
Topic: Head & neck Joints, Histology, Development, Radiography & Surface marking		**Number of competencies: (9)**			**Number of procedures for certification: (NIL)**				
AN43.1	Describe & demonstrate the movements with muscles producing the movements of atlantooccipital joint & atlantoaxial joint	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN43.2	Identify, describe and draw the microanatomy of pituitary gland, thyroid, parathyroid gland, tongue, salivary glands, tonsil, epiglottis, cornea, retina	K/S	SH	Y	Lecture, Practical	Written/ skill assessment			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN43.3	Identify, describe and draw microanatomy of olfactory epithelium, eyelid, lip, sclero-corneal junction, optic nerve, cochlea- organ of corti, pineal gland	K/S	SH	N	Lecture, Practical	Written/ skill assessment			
AN43.4	Describe the development and developmental basis of congenital anomalies of face, palate, tongue, branchial apparatus, pituitary gland, thyroid gland & eye	K	KH	Y	Lecture	Written/ Viva voce			
AN43.5	Demonstrate- 1) Testing of muscles of facial expression, extraocular muscles, muscles of mastication, 2) Palpation of carotid arteries, facial artery, superficial temporal artery, 3) Location of internal and external jugular veins, 4) Location of hyoid bone, thyroid cartilage and cricoid cartilage with their vertebral levels	K/S	SH	Y	Practical	Viva voce/ skill assessment		General Surgery	
AN43.6	Demonstrate surface projection of- Thyroid gland, Parotid gland and duct, Pterion, Common carotid artery, Internal jugular vein, Subclavian vein, External jugular vein, Facial artery in the face & accessory nerve	K/S	SH	N	Practical	Viva voce/ skill assessment		General Surgery	
AN43.7	Identify the anatomical structures in 1) Plain x-ray skull, 2) AP view and lateral view 3) Plain x-ray cervical spine-AP and lateral view 4) Plain x-ray of paranasal sinuses	K/S	SH	Y	Practical	Viva voce/ skill assessment		Radiodiagnosis	
AN43.8	Describe the anatomical route used for carotid angiogram and vertebral angiogram	K/S	SH	N	Practical	Viva voce/ skill assessment		Radiodiagnosis	
AN43.9	Identify anatomical structures in carotid angiogram and vertebral angiogram	K/S	SH	N	Practical	Viva voce/ skill assessment		Radiodiagnosis	
Topic: Anterior abdominal wall		**Number of competencies: (7)**				**Number of procedures for certification: (NIL)**			
AN44.1	Describe & demonstrate the Planes (transpyloric, transtubercular, subcostal, lateral vertical, linea alba, linea semilunaris), regions & Quadrants of abdomen	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN44.2	Describe & identify the Fascia, nerves & blood vessels of anterior abdominal wall	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN44.3	Describe the formation of rectus sheath and its contents	K	KH	Y	Lecture	Written/ Viva voce			
AN44.4	Describe & demonstrate extent, boundaries, contents of Inguinal canal including Hesselbach's triangle.	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN44.5	Explain the anatomical basis of inguinal hernia.	K	KH	Y	Lecture	Written/ Viva voce		General Surgery	
AN44.6	Describe & demonstrate attachments of muscles of anterior abdominal wall	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN44.7	Enumerate common Abdominal incisions	K	KH	N	Lecture	Written		General Surgery	
Topic: Posterior abdominal wall		**Number of competencies: (3)**				**Number of procedures for certification: (NIL)**			
AN45.1	Describe Thoracolumbar fascia	K	KH	Y	Lecture	Written			
AN45.2	Describe & demonstrate Lumbar plexus for its root value, formation & branches	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN45.3	Mention the major subgroups of back muscles, nerve supply and action	K	KH	N	Lecture	Written			
Topic: Male external genitalia		**Number of competencies: (5)**				**Number of procedures for certification: (NIL)**			
AN46.1	Describe & demonstrate coverings, internal structure, side determination, blood supply, nerve supply, lymphatic drainage & descent of testis with its applied anatomy	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN46.2	Describe parts of Epididymis	K	KH	Y	Lecture, Practical	Written/ Viva voce			
AN46.3	Describe Penis under following headings: (parts, components, blood supply and lymphatic drainage)	K	KH	Y	Lecture, Practical	Written/ Viva voce			
AN46.4	Explain the anatomical basis of Varicocoele	K	KH	N	Lecture	Written		General Surgery	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN46.5	Explain the anatomical basis of Phimosis & Circumcision	K	KH	N	Lecture	Written		General Surgery	
Topic: Abdominal cavity		**Number of competencies: (14)**				**Number of procedures for certification: (NIL)**			
AN47.1	Describe & identify boundaries and recesses of Lesser & Greater sac	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN47.2	Name & identify various peritoneal folds & pouches with its explanation .	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN47.3	Explain anatomical basis of Ascites & Peritonitis	K	KH	N	Lecture	Written		General Surgery	
AN47.4	Explain anatomical basis of Subphrenic abscess	K	KH	N	Lecture	Written		General Surgery	
AN47.5	Describe & demonstrate major viscera of abdomen under following headings (anatomical position, external and internal features, important peritoneal and other relations, blood supply, nerve supply, lymphatic drainage and applied aspects)	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN47.6	Explain the anatomical basis of Splenic notch, Accessory spleens, Kehr's sign, Different types of vagotomy, Liver biopsy (site of needle puncture), Referred pain in cholecystitis, Obstructive jaundice, Referred pain around umbilicus, Radiating pain of kidney to groin & Lymphatic spread in carcinoma stomach	K	KH	N	Lecture	Written		General Surgery	
AN47.7	Mention the clinical importance of Calot's triangle	K	KH	N	Lecture	Written		General Surgery	
AN47.8	Describe & identify the formation, course relations and tributaries of Portal vein, Inferior vena cava & Renal vein	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN47.9	Describe & identify the origin, course, important relations and branches of Abdominal aorta, Coeliac trunk, Superior mesenteric, Inferior mesenteric & Common iliac artery	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN47.10	Enumerate the sites of portosystemic anastomosis	K	KH	Y	Lecture	Written		General Surgery	
AN47.11	Explain the anatomic basis of hematemesis& caput medusae in portal hypertension	K	KH	Y	Lecture,	Written/ Viva voce		General Surgery	
AN47.12	Describe important nerve plexuses of posterior abdominal wall	K	KH	N	Lecture	Written			
AN47.13	Describe & demonstrate the attachments, openings, nerve supply & action of the thoracoabdominal diaphragm	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN47.14	Describe the abnormal openings of thoracoabdominal diaphragm and diaphragmatic hernia	K	KH	N	Lecture	Written		General Surgery	
Topic: Pelvic wall and viscera		**Number of competencies: (8)**				**Number of procedures for certification: (NIL)**			
AN48.1	Describe & identify the muscles of Pelvic diaphragm	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN48.2	Describe & demonstrate the (position, features, important peritoneal and other relations, blood supply, nerve supply, lymphatic drainage and clinical aspects of) important male & female pelvic viscera	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN48.3	Describe & demonstrate the origin, course, important relations and branches of internal iliac artery	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN48.4	Describe the branches of sacral plexus	K	KH	Y	Lecture	Written			
AN48.5	Explain the anatomical basis of suprapubic cystostomy, Urinary obstruction in benign prostatic hypertrophy, Retroverted uterus, Prolapse uterus, Internal and external haemorrhoids, Anal fistula, Vasectomy, Tubal pregnancy & Tubal ligation	K	KH	N	Lecture	Written		General Surgery	
AN48.6	Describe the neurological basis of Automatic bladder	K	KH	N	Lecture	Written		General Surgery	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN48.7	Mention the lobes involved in benign prostatic hypertrophy & prostatic cancer	K	KH	N	Lecture	Written		General Surgery	
AN48.8	Mention the structures palpable during vaginal & rectal examination	K	KH	N	Lecture	Written		Obstetrics & Gynaecology General Surgery	
Topic: Perineum		**Number of competencies: (5)**				**Number of procedures for certification: (NIL)**			
AN49.1	Describe & demonstrate the superficial & deep perineal pouch (boundaries and contents)	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		Obstetrics & Gynaecology	
AN49.2	Describe & identify Perineal body	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		Obstetrics & Gynaecology	
AN49.3	Describe & demonstrate Perineal membrane in male & female	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN49.4	Describe & demonstrate boundaries, content & applied anatomy of Ischiorectal fossa	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN49.5	Explain the anatomical basis of Perineal tear, Episiotomy, Perianal abscess and Anal fissure	K	KH	N	Lecture	Written		Obstetrics & Gynaecology	
Topic: Vertebral column		**Number of competencies: (4)**				**Number of procedures for certification: (NIL)**			
AN50.1	Describe the curvatures of the vertebral column	K	KH	Y	Lecture	Written/ Viva voce			
AN50.2	Describe & demonstrate the type, articular ends, ligaments and movements of Intervertebral joints, Sacroiliac joints & Pubic symphysis	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN50.3	Describe lumbar puncture (site, direction of the needle, structures pierced during the lumbar puncture)	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	
AN50.4	Explain the anatomical basis of Scoliosis, Lordosis, Prolapsed disc, Spondylolisthesis & Spina bifida	K	KH	N	Lecture	Written		Orthopedics	
Topic: Sectional Anatomy		**Number of competencies: (2)**				**Number of procedures for certification: (NIL)**			
AN51.1	Describe & identify the cross-section at the level of T8, T10 and L1 (transpyloric plane)	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		Radiodiagnosis	
AN51.2	Describe & identify the midsagittal section of male and female pelvis	K	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		Radiodiagnosis	
Topic: Histology & Embryology		**Number of competencies: (8)**				**Number of procedures for certification: (NIL)**			
AN52.1	Describe & identify the microanatomical features of Gastro-intestinal system: Oesophagus, Fundus of stomach, Pylorus of stomach, Duodenum, Jejunum, Ileum, Large intestine, Appendix, Liver, Gall bladder, Pancreas & Suprarenal gland	K/S	SH	**Y**	Lecture, Practical	Written/ skill assessment			
AN52.2	Describe & identify the microanatomical features of: Urinary system: Kidney, Ureter & Urinary bladder Male Reproductive System: Testis, Epididymis,Vas deferens, Prostate & penis Female reproductive system: Ovary, Uterus, Uterine tube, Cervix, Placenta & Umbilical cord	K/S	SH	Y	Lecture, Practical	Written/ skill assessment			
AN52.3	Describe & identify the microanatomical features of Cardiooesophageal junction, Corpus luteum	K/S	SH	N	Lecture, Practical	Written/ skill assessment			
AN52.4	Describe the development of anterior abdominal wall	K	KH	N	Lecture	Written/ Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN52.5	Describe the development and congenital anomalies of Diaphragm	K	KH	Y	Lecture	Written/ Viva voce		General Surgery	
AN52.6	Describe the development and congenital anomalies of: Foregut, Midgut & Hindgut	K	KH	Y	Lecture	Written/ Viva voce		General Surgery	
AN52.7	Describe the development of Urinary system	K	KH	Y	Lecture	Written/ Viva voce		General Surgery	
AN52.8	Describe the development of male & female reproductive system	K	KH	Y	Lecture	Written/ Viva voce		Obstetrics & Gynaecology	
Topic: Osteology		**Number of competencies: (4)**				**Number of procedures for certification: (NIL)**			
AN53.1	Identify & hold the bone in the anatomical position, Describe the salient features, articulations & demonstrate the attachments of muscle groups	K/S	SH	Y	Lecture, DOAP session	Viva voce/ skill assessment		General Surgery, Obstetrics & Gynaecology	
AN53.2	Demonstrate the anatomical position of bony pelvis & show boundaries of pelvic inlet, pelvic cavity, pelvic outlet	K/S	SH	Y	Lecture, DOAP session	Viva voce/ skill assessment		Obstetrics & Gynaecology	
AN53.3	Define true pelvis and false pelvis and demonstrate sex determination in male & female bony pelvis	K/S	SH	Y	Lecture, DOAP session	Viva voce/ skill assessment		Obstetrics & Gynaecology	
AN53.4	Explain and demonstrate clinical importance of bones of abdominopelvic region (sacralization of lumbar vertebra, Lumbarization of 1st sacral vertebra, types of bony pelvis & Coccyx)	K/S	SH	N	Lecture, DOAP session	Viva voce/ skill assessment			
Topic: Radiodiagnosis		**Number of competencies: (3)**				**Number of procedures for certification: (NIL)**			
AN54.1	Describe & identify features of plain X ray abdomen	K/S	SH	Y	Lecture, DOAP session	Viva voce/ skill assessment		Radiodiagnosis	
AN54.2	Describe & identify the special radiographs of abdominopelvic region (contrast X ray Barium swallow, Barium meal, Barium enema, Cholecystography, Intravenous pyelography & Hysterosalpingography)	K/S	SH	Y	Lecture, DOAP session	Viva voce/ skill assessment		Radiodiagnosis	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN54.3	Describe role of ERCP, CT abdomen, MRI, Arteriography in radiodiagnosis of abdomen	K	KH	N	Lecture	Viva voce		Radiodiagnosis	
Topic: Surface marking		**Number of competencies: (2)**				**Number of procedures for certification: (NIL)**			
AN55.1	Demonstrate the surface marking of; Regions and planes of abdomen, Superficial inguinal ring, Deep inguinal ring , McBurney's point, Renal Angle & Murphy's point	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Viva voce/ skill assessment		General Surgery	
AN55.2	Demonstrate the surface projections of: Stomach, Liver, Fundus of gall bladder, Spleen, Duodenum, Pancreas, Ileocaecal junction, Kidneys & Root of mesentery	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Viva voce/ skill assessment		General Surgery	
Topic: Meninges & CSF		**Number of competencies: (2)**				**Number of procedures for certification: (NIL)**			
AN56.1	Describe & identify various layers of meninges with its extent & modifications	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Medicine	
AN56.2	Describe circulation of CSF with its applied anatomy	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Physiology
Topic: Spinal Cord		**Number of competencies: (5)**				**Number of procedures for certification: (NIL)**			
AN57.1	Identify external features of spinal cord	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN57.2	Describe extent of spinal cord in child & adult with its clinical implication	K	KH	Y	Lecture	Written/ Viva voce			
AN57.3	Draw & label transverse section of spinal cord at mid-cervical & mid-thoracic level	K	KH	Y	Lecture	Written/ Viva voce			
AN57.4	Enumerate ascending & descending tracts at mid thoracic level of spinal cord	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Physiology

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN57.5	Describe anatomical basis of syringomyelia	K	KH	N	Lecture	Written		General Medicine	Physiology
Topic: Medulla Oblongata		**Number of competencies: (4)**				**Number of procedures for certification: (NIL)**			
AN58.1	Identify external features of medulla oblongata	K/S	SH	Y	Lecture, DOAP session	Written/ Viva voce/ skill assessment			
AN58.2	Describe transverse section of medulla oblongata at the level of 1) pyramidal decussation, 2) sensory decussation 3) ION	K	KH	Y	Lecture	Written/ Viva voce			
AN58.3	Enumerate cranial nerve nuclei in medulla oblongata with their functional group	K	KH	Y	Lecture	Written/ Viva voce			Physiology
AN58.4	Describe anatomical basis & effects of medial & lateral medullary syndrome	K	KH	N	Lecture	Written		General Medicine	Physiology
Topic: Pons		**Number of competencies: (3)**				**Number of procedures for certification: (NIL)**			
AN59.1	Identify external features of pons	K/S	SH	Y	Lecture, DOAP session	Written/ Viva voce/ skill assessment			Physiology
AN59.2	Draw & label transverse section of pons at the upper and lower level	K	KH	Y	Lecture	Written/ Viva voce			
AN59.3	Enumerate cranial nerve nuclei in pons with their functional group	K	KH	Y	Lecture	Written/ Viva voce			
Topic: Cerebellum		**Number of competencies: (3)**				**Number of procedures for certification: (NIL)**			
AN60.1	Describe & demonstrate external & internal features of cerebellum	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN60.2	Describe connections of cerebellar cortex and intracerebellar nuclei	K	KH	Y	Lecture	Written/ Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN60.3	Describe anatomical basis of cerebellar dysfunction	K	KH	N	Lecture	Written		General Medicine	Physiology
Topic: Midbrain		**Number of competencies: (3)**				**Number of procedures for certification: (NIL)**			
AN61.1	Identify external & internal features of midbrain	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN61.2	Describe internal features of midbrain at the level of superior & inferior colliculus	K	KH	Y	Lecture	Written/ Viva voce			
AN61.3	Describe anatomical basis & effects of Benedikt's and Weber's syndrome	K	KH	N	Lecture	Written		General Medicine	Physiology
Topic: Cranial nerve nuclei & Cerebral hemispheres		**Number of competencies: (6)**				**Number of procedures for certification: (NIL)**			
AN62.1	Enumerate cranial nerve nuclei with its functional component	K	KH	Y	Lecture	Written/ Viva voce			
AN62.2	Describe & demonstrate surfaces, sulci, gyri, poles, & functional areas of cerebral hemisphere	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Medicine	Physiology
AN62.3	Describe the white matter of cerebrum	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Physiology
AN62.4	Enumerate parts & major connections of basal ganglia & limbic lobe	K	KH	Y	Lecture	Written/ Viva voce			Physiology
AN62.5	Describe boundaries, parts, gross relations, major nuclei and connections of dorsal thalamus, hypothalamus, epithalamus, metathalamus and subthalamus	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Physiology
AN62.6	Describe & identify formation, branches & major areas of distribution of circle of Willis	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Medicine	Physiology

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
Topic: Ventricular System		**Number of competencies: (2)**			**Number of procedures for certification: (NIL)**				
AN63.1	Describe & demonstrate parts, boundaries & features of IIIrd, IVth & lateral ventricle	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			Physiology
AN63.2	Describe anatomical basis of congenital hydrocephalus	K	KH	N	Lecture	Written		Pediatrics	Physiology
Topic: Histology & Embryology		**Number of competencies: (3)**			**Number of procedures for certification: (NIL)**				
AN64.1	Describe & identify the microanatomical features of Spinal cord, Cerebellum & Cerebrum	K/S	SH	Y	Lecture,Practical	Written/ skill assessment			
AN64.2	Describe the development of neural tube, spinal cord, medulla oblongata, pons, midbrain, cerebral hemisphere & cerebellum	K	KH	Y	Lecture	Written/ Viva voce			
AN64.3	Describe various types of open neural tube defects with its embryological basis	K	KH	N	Lecture	Written/ Viva voce		Obstetrics & Gynaecology, Pediatrics	
Topic: Epithelium histology		**Number of competencies: (2)**			**Number of competencies for certification: (01)**				
AN65.1	Identify epithelium under the microscope & describe the various types that correlate to its function	K/S	P	Y	Lecture, Practical	Written/ skill assessment	1		
AN65.2	Describe the ultrastructure of epithelium	K	KH	N	Lecture, Practical	Written			
Topic: Connective tissue histology		**Number of competencies: (2)**			**Number of procedures for certification: (NIL)**				
AN66.1	Describe & identify various types of connective tissue with functional correlation	K/S	SH	Y	Lecture, Practical	Written/ skill assessment			Physiology
AN66.2	Describe the ultrastructure of connective tissue	K	KH	N	Lecture, Practical	Written		Pathology	
Topic: Muscle histology		**Number of competencies: (3)**			**Number of procedures for certification: (NIL)**				

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN67.1	Describe & identify various types of muscle under the microscope	K/S	SH	Y	Lecture, Practical	Written/ skill assessment			
AN67.2	Classify muscle and describe the structure-function correlation of the same	K	KH	Y	Lecture, Practical	Written			Physiology
AN67.3	Describe the ultrastructure of muscular tissue	K	KH	N	Lecture, Practical	Written			
Topic: Nervous tissue histology		**Number of competencies: (3)**				**Number of procedures for certification: (NIL)**			
AN68.1	Describe & Identify multipolar & unipolar neuron, ganglia, peripheral nerve	K/S	SH	Y	Lecture, Practical	Written/ skill assessment			
AN68.2	Describe the structure-function correlation of neuron	K	KH	Y	Lecture, Practical	Written			Physiology
AN68.3	Describe the ultrastructure of nervous tissue	K	KH	N	Lecture, Practical	Written			
Topic: Blood Vessels		**Number of competencies: (3)**				**Number of procedures for certification: (NIL)**			
AN69.1	Identify elastic & muscular blood vessels, capillaries under the microscope	K/S	SH	Y	Lecture, Practical	Skill assessment			
AN69.2	Describe the various types and structure-function correlation of blood vessel	K	KH	Y	Lecture, Practical	Written			Physiology
AN69.3	Describe the ultrastructure of blood vessels	K	KH	Y	Lecture, Practical	Written			
Topic: Glands & Lymphoid tissue		**Number of competencies: (2)**				**Number of procedures for certification: (NIL)**			
AN70.1	Identify exocrine gland under the microscope & distinguish between serous, mucous and mixed acini	K/S	SH	Y	Lecture, Practical	Written/ skill assessment		Pathology	
AN70.2	Identify the lymphoid tissue under the microscope & describe microanatomy of lymph node, spleen, thymus, tonsil and correlate the structure with function	K/S	SH	Y	Lecture, Practical	Written/ skill assessment		Pathology	
Topic: Bone & Cartilage		**Number of competencies: (2)**				**Number of procedures for certification: (NIL)**			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN71.1	Identify bone under the microscope; classify various types and describe the structure-function correlation of the same	K/S	SH	Y	Lecture, Practical	Written/ skill assessment		Pathology	
AN71.2	Identify cartilage under the microscope & describe various types and structure- function correlation of the same	K/S	SH	Y	Lecture, Practical	Written/ skill assessment		Pathology	
Topic: Integumentary System		**Number of competencies: (1)**				**Number of procedures for certification: (NIL)**			
AN72.1	Identify the skin and its appendages under the microscope and correlate the structure with function	K/S	SH	Y	Lecture, Practical	Written/ skill assessment			
Topic: Chromosomes		**Number of competencies: (3)**				**Number of procedures for certification: (NIL)**			
AN73.1	Describe the structure of chromosomes with classification	K	KH	Y	Lecture	Written			
AN73.2	Describe technique of karyotyping with its applications	K	KH	Y	Lecture	Written			
AN73.3	Describe the Lyon's hypothesis	K	KH	Y	Lecture	Written			
Topic: Patterns of Inheritance		**Number of competencies: (4)**				**Number of procedures for certification: (NIL)**			
AN74.1	Describe the various modes of inheritance with examples	K	KH	Y	Lecture	Written		General Medicine, Pediatrics	
AN74.2	Draw pedigree charts for the various types of inheritance & give examples of diseases of each mode of inheritance	K	KH	Y	Lecture	Written		General Medicine, Pediatrics	
AN74.3	Describe multifactorial inheritance with examples	K	KH	Y	Lecture	Written		General Medicine	
AN74.4	Describe the genetic basis & clinical features of Achondroplasia, Cystic Fibrosis, Vitamin D resistant rickets, Haemophilia, Duchene's muscular dystrophy & Sickle cell anaemia	K	KH	N	Lecture	Written		General Medicine, Pediatrics	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
Topic: Principle of Genetics, Chromosomal Aberrations & Clinical Genetics		**Number of competencies: (5)**				**Number of procedures for certification: (NIL)**			
AN75.1	Describe the structural and numerical chromosomal aberrations	K	KH	Y	Lecture	Written		Pediatrics	
AN75.2	Explain the terms mosaics and chimeras with example	K	KH	N	Lecture	Written		Pediatrics	
AN75.3	Describe the genetic basis & clinical features of Prader Willi syndrome, Edward syndrome & Patau syndrome	K	KH	N	Lecture	Written		Pediatrics	
AN75.4	Describe genetic basis of variation: polymorphism and mutation	K	KH	Y	Lecture	Written		Pediatrics	
AN75.5	Describe the principles of genetic counselling	K	KH	Y	Lecture	Written		Pediatrics, Obstetrics & Gynaecology	
Topic: Introduction to embryology		**Number of competencies: (2)**				**Number of procedures for certification: (NIL)**			
AN76.1	Describe the stages of human life	K	KH	Y	Lecture	Written			
AN76.2	Explain the terms- phylogeny, ontogeny, trimester, viability	K	KH	Y	Lecture	written			
Topic: Gametogenesis and fertilization		**Number of competencies: (6)**				**Number of procedures for certification: (NIL)**			
AN77.1	Describe the uterine changes occurring during the menstrual cycle	K	KH	Y	Lecture	Written		Obstetrics & Gynaecology	
AN77.2	Describe the synchrony between the ovarian and menstrual cycles	K	KH	Y	Lecture	Written		Obstetrics & Gynaecology	
AN77.3	Describe spermatogenesis and oogenesis along with diagrams	K	KH	Y	Lecture	Written		Obstetrics & Gynaecology	
AN77.4	Describe the stages and consequences of fertilisation	K	KH	Y	Lecture	Written		Obstetrics & Gynaecology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN77.5	Enumerate and describe the anatomical principles underlying contraception	K	KH	Y	Lecture	Written		Obstetrics & Gynaecology	
AN77.6	Describe teratogenic influences; fertility and sterility, surrogate motherhood, social significance of “sex-ratio”.	K	KH	N	Lecture	Written		Obstetrics & Gynaecology	
Topic: Second week of development		**Number of competencies: (5)**				**Number of procedures for certification: (NIL)**			
AN78.1	Describe cleavage and formation of blastocyst	K	KH	Y	Lecture	Written			
AN78.2	Describe the development of trophoblast	K	KH	Y	Lecture	Written			
AN78.3	Describe the process of implantation & common abnormal sites of implantation	K	KH	Y	Lecture	Written		Obstetrics & Gynaecology	
AN78.4	Describe the formation of extra-embryonic mesoderm and coelom, bilaminar disc and prochordal plate	K	KH	Y	Lecture	Written			
AN78.5	Describe in brief abortion; decidual reaction, pregnancy test	K	KH	Y	Lecture	Written		Obstetrics & Gynaecology	
Toic: 3rd to 8th week of development		**Number of competencies: (6)**				**Number of procedures for certification: (NIL)**			
AN79.1	Describe the formation & fate of the primitive streak	K	KH	Y	Lecture	Written			
AN79.2	Describe formation & fate of notochord	K	KH	Y	Lecture	Written			
AN79.3	Describe the process of neurulation	K	KH	Y	Lecture	Written			
AN79.4	Describe the development of somites and intra-embryonic coelom	K	KH	Y	Lecture	Written		Obstetrics & Gynaecology	
AN79.5	Explain embryological basis of congenital malformations, nucleus pulposus, sacrococcygeal teratomas, neural tube defects	K	KH	N	Lecture	Written		Obstetrics & Gynaecology	
AN79.6	Describe the diagnosis of pregnancy in first trimester and role of teratogens, alpha-fetoprotein	K	KH	N	Lecture	Written		Obstetrics & Gynaecology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
Topic: Fetal membranes	**Number of competencies: (7)**				**Number of procedures for certification: (NIL)**				
AN80.1	Describe formation, functions & fate of-chorion: amnion; yolk sac; allantois & decidua	K	KH	Y	Lecture	Written			
AN80.2	Describe formation & structure of umbilical cord	K	KH	Y	Lecture	Written			
AN80.3	Describe formation of placenta, its physiological functions, foetomaternal circulation & placental barrier	K	KH	Y	Lecture	Written		Obstetrics & Gynaecology	
AN80.4	Describe embryological basis of twinning in monozygotic & dizygotic twins	K	KH	Y	Lecture	Written		Obstetrics & Gynaecology	
AN80.5	Describe role of placental hormones in uterine growth & parturition	K	KH	Y	Lecture	Written		Obstetrics & Gynaecology	
AN80.6	Explain embryological basis of estimation of fetal age.	K	KH	N	Lecture	Written		Obstetrics & Gynaecology	
AN80.7	Describe various types of umbilical cord attachments	K	KH	N	Lecture	Written		Obstetrics & Gynaecology	
Topic: Prenatal Diagnosis	**Number of competencies: (3)**				**Number of procedures for certification: (NIL)**				
AN81.1	Describe various methods of prenatal diagnosis	K	KH	Y	Lecture	Written		Obstetrics & Gynaecology	
AN81.2	Describe indications, process and disadvantages of amniocentesis	K	KH	Y	Lecture	Written		Obstetrics & Gynaecology	
AN81.3	Describe indications, process and disadvantages of chorion villus biopsy	K	KH	Y	Lecture	Written		Obstetrics & Gynaecology	
Topic: Ethics in Anatomy	**Number of competencies: (1)**				**Number of procedures for certification: (NIL)**				

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN 82.1	Demonstrate respect and follow the correct procedure when handling cadavers and other biologic tissue	S	SH	Y	Group Activity	NIL		AETCOM	
	Column C: K- Knowledge, S – Skill, A - Attitude / professionalism, C- Communication. **Column D: K – Knows, KH - Knows How, SH - Shows how, P- performs independently,** **Column F: DOAP session – Demonstrate, Observe, Assess, Perform.** **Column H: If entry is P: indicate how many procedures must be done independently for certification/ graduation**								
Integration									
			Physiology						
PY3.1	Describe the structure and functions of a neuron and neuroglia; Discuss Nerve Growth Factor & other growth factors/cytokines	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY3.7	Describe the different types of muscle fibres and their structure	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY3.13	Describe muscular dystrophy: myopathies	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		General Medicine	Human Anatomy
PY4.1	Describe the structure and functions of digestive system	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY5.1	Describe the functional Anatomy of heart including chambers, sounds; and Pacemaker tissue and conducting system.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY5.6	Describe abnormal ECG, arrythmias, heart block and myocardial Infarction	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		General Medicine	Human Anatomy
PY9.1	Describe and discuss sex determination; sex differentiation and their abnormities and outline psychiatry and practical implication of sex determination.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY10.1	Describe and discuss the organization of nervous system	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
PY10.2	Describe and discuss the functions and properties of synapse, reflex, receptors	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY10.3	Describe and discuss somatic sensations & sensory tracts	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY10.4	Describe and discuss motor tracts, mechanism of maintenance of tone, control of body movements, posture and equilibrium & vestibular apparatus	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY10.5	Describe and discuss structure and functions of reticular activating system, autonomic nervous system (ANS)	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY10.6	Describe and discuss Spinal cord, its functions, lesion & sensory disturbances	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY10.7	Describe and discuss functions of cerebral cortex, basal ganglia, thalamus, hypothalamus, cerebellum and limbic system and their abnormalities	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Psychiatry	Human Anatomy
PY10.11	Demonstrate the correct clinical examination of the nervous system: Higher functions, Sensory system, motor system, reflexes, Cranial Nerves in a normal volunteer or simulated environment	S	P	Y	DOAP sessions	Skill assessment / Viva voce / OSCE	1 each (total 5)		Human Anatomy
Biochemistry									
BI6.13	Describe the functions of the kidney, liver, thyroid and adrenal glands .	K	KH	Y	Lecture, Small group discussions	Written/ Viva voce		Pathology, General Medicine	Physiology, Human Anatomy
BI6.14	Describe the tests that are commonly done in clinical practice to assess the functions of these organs (kidney, liver, thyroid and adrenal glands).	K	KH	Y	Lecture, Small group discussions	Written/ Viva voce		Pathology, General Medicine	Physiology, Human Anatomy
BI6.15	Describe the abnormalities of kidney, liver, thyroid and adrenal glands	K	KH	Y	Lecture, Small group discussions	Written/ Viva voce		Pathology, General Medicine	Physiology, Human Anatomy
Pathology									

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
PA28.10	Describe the etiology, pathogenesis, pathology, laboratory findings, distinguishing features progression and complications of acute and chronic pyelonephritis and reflux nephropathy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy, General Surgery	
PA31.1	Classify and describe the types, etiology, pathogenesis, pathology and hormonal dependency of benign breast disease	K	KH	Y	Lecture, Small group	Written/ Viva voce		Human Anatomy, General Surgery	
PA32.1	Enumerate, classify and describe the etiology, pathogenesis, pathology and iodine dependency of thyroid swellings	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy Physiology, General Medicine, General Surgery	
PA32.9	Describe the etiology, pathogenesis, manifestations, laboratory and morphologic features of adrenal neoplasms	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy, Physiology, General Medicine, General Surgery	
PA33.1	Classify and describe the etiology, pathogenesis, manifestations, radiologic and morphologic features and complications of osteomyelitis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy, Orthopedics	Microbiology
Forensic Medicine & Toxicology									
FM2.28	Describe and discuss signs of intrauterine death, signs of live birth, viability of foetus, age determination of foetus, DOAP session of ossification centres, Hydrostatic test, Sudden infants death syndrome and Munchausen's syndrome by proxy.	K	KH	Y	Lectures,Small group discussion, Autopsy, DOAP session	Written/Viva voce/ OSCE		Pediatrics, Human Anatomy	
FM3.1	Identification Define and describe Corpus Delicti, establishment of identity of living persons including race, Sex, religion, complexion, stature, age determination using morphology, teeth-eruption, decay, bite marks, bones-ossification centres, medico-legal aspects of age.	K	KH	Y	Lectures,Small group discussion, Bedside clinic, DOAP session	Written/ Viva voce/skill assessment		Human Anatomy	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
			Anesthesiology						
AS4.2	Describe the Anatomy of the airway and its implications for general anaesthesia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy	
AS5.2	Describe the correlative Anatomy of the brachial plexus, subarachnoid and epidural spaces	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy	
AS5.3	Observe and describe the principles and steps/ techniques involved in peripheral nerve blocks	S	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce		Human Anatomy	
AS8.1	Describe the anatomical correlates and physiologic principles of pain	K	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce		Human Anatomy Physiology	
			ENT						
EN1.1	Describe the Human Anatomy & physiology of ear, nose, throat, head & neck.	K	KH	Y	Lecture, Small group discission, DOAP session	Written/ Viva voce/Skill assessment		Human Anatomy	
			Ophthalmology						
OP2.1	Enumerate the causes, describe and discuss the aetiology, clinical presentations and diagnostic features of common conditions of the lid and adnexa including Hordeolum externum/ internum, blepharitis, preseptal cellulitis, dacryocystitis, hemangioma, dermoid, ptosis, entropion, lid lag, lagopthalmos	K	KH	Y	Lecture,Small group discussion	Written/ Viva voce		Human Anatomy	
OP4.1	Enumerate describe and discuss the types and causes of corneal ulceration	K	KH	Y	Lecture,Small group discussion	Written/ Viva voce		Human Anatomy	
OP6.7	Enumerate and discuss the aetiology, the clinical distinguishing features of various glaucomas associated with shallow and deep anterior chamber. Choose appropriate investigations and treatment for patients with above conditions.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
OP7.1	Describe the surgical anatomy and the metabolism of the lens	K	KH	Y	Lecture,Small group discussion	Written/ Viva voce		Biochemistry, Human Anatomy	
OP8.1	Discuss the aetiology, pathology, clinical features and management of vascular occlusions of the retina	K	KH	Y	Lecture,Small group discussion	Written/ Viva voce		Human Anatomy, Pathology	
Dentistry									
DE1.1	Enumerate the parts of the tooth	K	K	N	Lecture,Small group discussion	Viva voce		Human Anatomy	
DE5.1	Enumerate the parts of the tooth and supporting structures	K	K	N	Lecture, Small group discussion	Viva voce		Human Anatomy	
General Medicine									
IM3.1	Define discuss describe and distinguish community acquired pneumonia, nosocomial pneumonia and aspiration pneumonia	K	K	Y	Lecture, Small Group discussion	short note/ Viva voce		Human Anatomy, Pathology, Microbiology	
IM13.9	Demonstrate in a mannequin the correct technique for performing breast exam, rectal examination and cervical examination and pap smear	S	K	Y	Bedside clinic	Skill assessment/ short case		Human Anatomy	General Surgery
IM17.1	Define and classify headache and describe the presenting features, precipitating factors, aggravating and relieving factors of various kinds of headache	K	KH	Y	Lecture, Small group discussion	short note/ Viva voce		Human Anatomy	
IM18.1	Describe the functional and the vascular anatomy of the brain	K	KH	Y	Lecture, Small Group discussion	Written/ Viva voce		Human Anatomy	
IM19.1	Describe the functional anatomy of the locomotor system of the brain	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Human Anatomy, Physiology	
Obstetrics & Gynaecology									

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
OG2.1	Describe and discuss the development and anatomy of the female reproductive tract, relationship to other pelvic organs, applied anatomy as related to Obstetrics and Gynaecology.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce/ Skill assessment		Human Anatomy	
OG4.1	Describe and discuss the basic embryology of fetus , factors influencing fetal growth and development, anatomy and physiology of placenta, and teratogenesis	K	K	Y	Lecture, Small group discussion	Theory		Human Anatomy	
OG14.1	Enumerate and discuss the diameters of maternal pelvis and types	K	KH	Y	Lecture, Small group discussion, Bedside clinic, DOAP session	Written/ Viva voce/ skill assessment		Human Anatomy	
General Surgery									
SU19.1	Describe the etiology and classification of cleft lip and palate	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
SU19.2	Describe the Principles of reconstruction of cleft lip and palate	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
SU22.1	Describe the Applied anatomy, and physiology of thyroid	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
SU22.5	Describe the applied anatomy of parathyroid.	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
SU23.1	Describe the applied anatomy of adrenal glands	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
SU24.1	Describe the clinical features, principles of investigation, prognosis and management of pancreatitis.	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
SU25.1	Describe applied anatomy appropriate investigations for breast disease	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
SU28.2	Describe the clinical features, investigations and principles of management of congenital anomalies of Genitourinary system.	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
SU28.5	Describe the applied anatomy and physiology of esophagus	K	K	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce		Human Anatomy, Physiology	
SU28.7	Describe the applied anatomy and physiology of stomach.	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
SU28.10	Describe the applied anatomy of liver. Describe the Clinical features, Investigations and principles of management of Liver abscess, hydatid disease, Injuries and Tumors of the liver.	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
SU28.11	Describe the applied anatomy of Spleen. Describe the clinical features, Investigations and principles of management of splenic injuries. Describe the Post-splenectomy sepsis- prophylaxis.	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
SU28.12	Describe the applied anatomy of biliary system. Describe the clinical features, investigations and principles of management of diseases of biliary system.	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
SU28.13	Describe the applied anatomy of small and large intestines	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
SU28.16	Describe applied anatomy including congenital anomalies of the rectum and anal canal	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
SU30.2	Describe the applied anatomy, clinical features, investigations and principles of management of Undescended testis.	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
SU30.3	Describe the applied anatomy, clinical features, investigations and principles of management of Epidydimo-orchitis	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
SU30.4	Describe the applied anatomy, clinical features, investigations and principles of management of Varicocele	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
SU30.5	Describe the applied anatomy, clinical features, investigations and principles of management of Hydrocele	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
	Orthopaedics								
OR2.1	Describe and discuss the mechanism of Injury, clinical features, investigations and plan management of fracture of clavicle	K/S	KH/SH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE	1	Human Anatomy	
OR2.2	Describe and discuss the mechanism of Injury, clinical features, investigations and plan management of fractures of proximal humerus	K	K/KH/SH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
OR2.3	Describe and discuss the mechanism of Injury, clinical features, investigations and plan management of supra condylar fracture of humerus	K	KH/SH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
OR2.4	Describe and discuss the mechanism of injury, clinical features, investigations and principles of management of fracture of shaft of humerus and intercondylar fracture humerus with emphasis on neurovasular deficit	K/S	K/KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
OR2.5	Describe and discuss the aetiopathogenesis, clinical features, mechanism of injury, investigation & principles of management of fractures of both bones forearm and Galeazzi and Monteggia injury	K	K/KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
OR2.6	Describe and discuss the aetiopathogenesis, mechanism of injury, clinical features, investigations and principles of management of fractures of distal radius	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
OR2.7	Describe and discuss the aetiopathogenesis, mechanism of injury, clinical features, investigations and principles of management of pelvic injuries with emphasis on hemodynamic instability	K	K/KH/SH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
OR2.8	Describe and discuss the aetiopathogenesis, mechanism of injury, clinical features, investigations and principles of management of spine injuries with emphasisi on mobilisation of the patient	K	K/KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
OR2.9	Describe and discuss the mechanism of injury, Clinical features, investigations and principle of management of acetabular fracture	K	K/KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
OR2.10	Describe and discuss the aetiopathogenesis, mechanism of injury, clinical features, investigations and principles of management of fractures of proximal femur	K/S/A/C	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
OR2.11	Describe and discuss the aetiopathogenesis, mechanism of injury, clinical features, investigations and principles of management of (a) Fracture patella (b) Fracture distal femur © Fracture proximal tibia with special focus on neurovascular injury and compartment syndrome	K	K/KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
OR2.12	Describe and discuss the aetiopathogenesis, clinical features, Investigation and principles of management of Fracture shaft of femur in all age groups and the recognition and management of fat embolism as a complication	K	K/KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
OR2.13	Describe and discuss the aetiopathogenesis, clinical features, Investigation and principles of management of: (a) Fracture both bones leg (b) Calcaneus (c) Small bones of foot	K	K/KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
OR2.14	Describe and discuss the aetiopathogenesis, clinical features, Investigation and principles of management of ankle fractures	K/S/C	K/KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
OR2.15	Plan and interpret the investigations to diagnose complications of fractures like malunion, non-union, infection, compartmental syndrome	K/S	SH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE	2	Human Anatomy	
OR2.16	Describe and discuss the mechanism of injury, clinical features, investigations and principles of management of open fractures with focus on secondary infection, prevention and management	K	K/KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
OR11.1	Describe and discuss the aetiopathogenesis, Clinical features, Investigations and principles of management of peripheral nerve injuries in diseases like foot drop, wrist drop, claw hand, palsies of Radial, Ulnar, Median, Lateral Popliteal and Sciatic Nerves	K	K/H	Y	Lecture, Small Group discussion, case discussion	Written/ Viva voce/ OSCE		Human Anatomy	General Medicine, General surgery
OR12.1	Describe and discuss the Clinical features, Investigations and principles of management of Congenital and acquired malformations and deformities of: a. limbs and spine - Scoliosis and spinal bifida b. Congenital dislocation of Hip,Torticollis, c. congenital talipes equino varus	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce/ OSCE		Human Anatomy	
Physical Medicine & Rehabilitation									
PM2.1	Describe the causes of disability in the patient with a cerebrovascular accident	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy	General Medicine
PM3.1	Describe and discuss the clinical features, types, evaluation, diagnosis and management of cerebral palsy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy	Pediatrics
Pediatrics									
PE32.1	Discuss the genetic basis, risk factors, complications, prenatal diagnosis, management and genetic counselling in Down's Syndrome	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy	

PHYSIOLOGY (CODE: PY)

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PHYSIOLOGY									
Topic: General Physiology		**Number of competencies: (09)**				**Number of procedures that require certification : (NIL)**			
PY1.1	Describe the structure and functions of a mammalian cell	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY1.2	Describe and discuss the principles of homeostasis	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY1.3	Describe intercellular communication	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY1.4	Describe apoptosis – programmed cell death	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Pathology	
PY1.5	Describe and discuss transport mechanisms across cell membranes	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY1.6	Describe the fluid compartments of the body, its ionic composition & measurements	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Biochemistry
PY1.7	Describe the concept of pH & Buffer systems in the body	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Biochemistry
PY1.8	Describe and discuss the molecular basis of resting membrane potential and action potential in excitable tissue	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY1.9	Demonstrate the ability to describe and discuss the methods used to demonstrate the functions of the cells and its products, its communications and their applications in Clinical care and research.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
Topic: Haematology		**Number of competencies: (13)**				**Number of procedures that require certification: (NIL)**			

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PY2.1	Describe the composition and functions of blood components	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY2.2	Discuss the origin, forms, variations and functions of plasma proteins	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Biochemistry
PY2.3	Describe and discuss the synthesis and functions of Haemoglobin and explain its breakdown. Describe variants of haemoglobin	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Biochemistry
PY2.4	Describe RBC formation (erythropoiesis & its regulation) and its functions	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY2.5	Describe different types of anaemias & Jaundice	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Pathology	Biochemistry
PY2.6	Describe WBC formation (granulopoiesis) and its regulation	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY2.7	Describe the formation of platelets, functions and variations.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY2.8	Describe the physiological basis of hemostasis and, anticoagulants. Describe bleeding & clotting disorders (Hemophilia, purpura)	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Pathology	
PY2.9	Describe different blood groups and discuss the clinical importance of blood grouping, blood banking and transfusion	K	KH	Y	Lecture, Small group discussion, ECE- Visit to blood bank	Written/Viva voce		Pathology	
PY2.10	Define and classify different types of immunity. Describe the development of immunity and its regulation	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY2.11	Estimate Hb, RBC, TLC, RBC indices, DLC, Blood groups, BT/CT	S	SH	Y	DOAP sessions	Practical/OSPE/Viva voce		Pathology	
PY2.12	Describe test for ESR, Osmotic fragility, Hematocrit. Note the findings and interpret the test results etc	K	KH	Y	Demonstration	Written /Viva voce		Pathology	

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PY2.13	Describe steps for reticulocyte and platelet count	K	KH	Y	Demonstration sessions	Written /Viva voce		Pathology	
Topic: Nerve and Muscle Physiology		**Number of competencies: (18)**				**Number of procedures that require certification: (NIL)**			
PY3.1	Describe the structure and functions of a neuron and neuroglia; Discuss Nerve Growth Factor & other growth factors/cytokines	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY3.2	Describe the types, functions & properties of nerve fibers	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY3.3	Describe the degeneration and regeneration in peripheral nerves	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		General Medicine	
PY3.4	Describe the structure of neuro-muscular junction and transmission of impulses	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Anaesthesiology	
PY3.5	Discuss the action of neuro-muscular blocking agents	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Anaesthesiology, Pharmacology	
PY3.6	Describe the pathophysiology of Myasthenia gravis	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Pathology	
PY3.7	Describe the different types of muscle fibres and their structure	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY3.8	Describe action potential and its properties in different muscle types (skeletal & smooth)	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY3.9	Describe the molecular basis of muscle contraction in skeletal and in smooth muscles	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY3.10	Describe the mode of muscle contraction (isometric and isotonic)	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY3.11	Explain energy source and muscle metabolism	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Biochemistry

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PY3.12	Explain the gradation of muscular activity	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		General Medicine	
PY3.13	Describe muscular dystrophy: myopathies	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		General Medicine	Human Anatomy
PY3.14	Perform Ergography	S	SH	Y	DOAP sessions	Practical/OSPE/Viva voce			
PY3.15	Demonstrate effect of mild, moderate and severe exercise and record changes in cardiorespiratory parameters	S	SH	Y	DOAP sessions	Practical/OSPE/Viva voce			
PY3.16	Demonstrate Harvard Step test and describe the impact on induced physiologic parameters in a simulated environment	S	SH	Y	DOAP sessions	Practical/OSPE/Viva voce			
PY3.17	Describe Strength-duration curve	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY3.18	Observe with Computer assisted learning (i) amphibian nerve - muscle experiments (ii) amphibian cardiac experiments	S	KH	Y	Demonstration, Computer assisted learning methods	Practical / Viva voce			
Topic: Gastro-intestinal Physiology		**Number of competencies: (10)**				**Number of procedures that require certification: (NIL)**			
PY4.1	Describe the structure and functions of digestive system	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY4.2	Describe the composition, mechanism of secretion, functions, and regulation of saliva, gastric, pancreatic, intestinal juices and bile secretion	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Biochemistry
PY4.3	Describe GIT movements, regulation and functions. Describe defecation reflex. Explain role of dietary fibre.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY4.4	Describe the physiology of digestion and absorption of nutrients	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Biochemistry

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PY4.5	Describe the source of GIT hormones, their regulation and functions	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY4.6	Describe the Gut-Brain Axis	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY4.7	Describe & discuss the structure and functions of liver and gall bladder	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Biochemistry
PY4.8	Describe & discuss gastric function tests, pancreatic exocrine function tests & liver function tests	K	KH	Y	Lecture, Small group discussion, Demonstration Esophageal Manometry & endoscopy	Written/Viva voce			Biochemistry
PY4.9	Discuss the physiology aspects of: peptic ulcer, gastro-oesophageal reflux disease, vomiting, diarrhoea, constipation, Adynamic ileus, Hirschsprung's disease	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		General Medicine	Biochemistry
PY4.10	Demonstrate the correct clinical examination of the abdomen in a normal volunteer or simulated environment	S	SH	Y	DOAP session	Skill assessment/ Viva voce/OSCE			
Topic: Cardiovascular Physiology (CVS)		**Number of competencies: (16)**			**Number of procedures that require certification: (03)**				
PY5.1	Describe the functional anatomy of heart including chambers, sounds; and Pacemaker tissue and conducting system.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY5.2	Describe the properties of cardiac muscle including its morphology, electrical, mechanical and metabolic functions	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY5.3	Discuss the events occurring during the cardiac cycle	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY5.4	Describe generation, conduction of cardiac impulse	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY5.5	Describe the physiology of electrocardiogram (E.C.G), its applications and the cardiac axis	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		General Medicine	

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PY5.6	Describe abnormal ECG, arrythmias, heart block and myocardial Infarction	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		General Medicine	Human Anatomy
PY5.7	Describe and discuss haemodynamics of circulatory system	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY5.8	Describe and discuss local and systemic cardiovascular regulatory mechanisms	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY5.9	Describe the factors affecting heart rate, regulation of cardiac output & blood pressure	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY5.10	Describe & discuss regional circulation including microcirculation, lymphatic circulation, coronary, cerebral, capillary, skin, foetal, pulmonary and splanchnic circulation	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		General Medicine	
PY5.11	Describe the patho-physiology of shock, syncope and heart failure	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY5.12	Record blood pressure & pulse at rest and in different grades of exercise and postures in a volunteer or simulated environment	S	SH	Y	DOAP sessions	Practical/OSPE/ Viva voce	1 each x 3		
PY5.13	Record and interpret normal ECG in a volunteer or simulated environment	S	SH	Y	DOAP sessions	Practical/OSPE/ Viva voce		General Medicine	
PY5.14	Observe cardiovascular autonomic function tests in a volunteer or simulated environment	S	SH	N	DOAP sessions	Skill assessment/ Viva voce			
PY5.15	Demonstrate the correct clinical examination of the cardiovascular system in a normal volunteer or simulated environment	S	SH	Y	DOAP sessions	Practical/OSPE/ Viva voce			
PY5.16	Record Arterial pulse tracing using finger plethysmography in a volunteer or simulated environment	S	SH	N	DOAP sessions, Computer assisted learning methods	Practical/OSPE/ Viva voce		General Medicine	
Topic: Respiratory Physiology		**Number of competencies: (10)**				**Number of procedures that require certification: (01)**			

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PY6.1	Describe the functional anatomy of respiratory tract	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY6.2	Describe the mechanics of normal respiration, pressure changes during ventilation, lung volume and capacities, alveolar surface tension, compliance, airway resistance, ventilation, V/P ratio, diffusion capacity of lungs	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY6.3	Describe and discuss the transport of respiratory gases: Oxygen and Carbon dioxide	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY6.4	Describe and discuss the physiology of high altitude and deep sea diving	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY6.5	Describe and discuss the principles of artificial respiration, oxygen therapy, acclimatization and decompression sickness.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY6.6	Describe and discuss the pathophysiology of dyspnoea, hypoxia, cyanosis asphyxia; drowning, periodic breathing	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY6.7	Describe and discuss lung function tests & their clinical significance	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY6.8	Demonstrate the correct technique to perform & interpret Spirometry	S	SH	Y	DOAP sessions	Skill assessment/ Viva voce		Respiratory Medicine	
PY6.9	Demonstrate the correct clinical examination of the respiratory system in a normal volunteer or simulated environment	S	P	Y	DOAP sessions	Skill assessment/ Viva voce/OSCE	1		
PY6.10	Demonstrate the correct technique to perform measurement of peak expiratory flow rate in a normal volunteer or simulated environment	S	SH	Y	DOAP sessions	Practical/OSPE/ Viva voce			
Topic: Renal Physiology		**Number of competencies: (09)**			**Number of procedures that require certification: (NIL)**				
PY7.1	Describe structure and function of kidney	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY7.2	Describe the structure and functions of juxta glomerular apparatus and role of renin-angiotensin system	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PY7.3	Describe the mechanism of urine formation involving processes of filtration, tubular reabsorption & secretion; concentration and diluting mechanism	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY7.4	Describe & discuss the significance & implication of Renal clearance	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY7.5	Describe the renal regulation of fluid and electrolytes & acid-base balance	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY7.6	Describe the innervations of urinary bladder, physiology of micturition and its abnormalities	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY7.7	Describe artificial kidney, dialysis and renal transplantation	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		General Medicine	
PY7.8	Describe & discuss Renal Function Tests	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Biochemistry
PY7.9	Describe cystometry and discuss the normal cystometrogram	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
Topic: Endocrine Physiology		**Number of competencies: (06)**			**Number of procedures that require certification : (NIL)**				
PY8.1	Describe the physiology of bone and calcium metabolism	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY8.2	Describe the synthesis, secretion, transport, physiological actions, regulation and effect of altered (hypo and hyper) secretion of pituitary gland, thyroid gland, parathyroid gland, adrenal gland, pancreas and hypothalamus	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY8.3	Describe the physiology of Thymus & Pineal Gland	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY8.4	Describe function tests: Thyroid gland; Adrenal cortex, Adrenal medulla and pancreas	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Biochemistry

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PY8.5	Describe the metabolic and endocrine consequences of obesity & metabolic syndrome, Stress response. Outline the psychiatry component pertaining to metabolic syndrome.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY8.6	Describe & differentiate the mechanism of action of steroid, protein and amine hormones	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
Topic: Reproductive Physiology		**Number of competencies: (12)**				**Number of procedures that require certification: (NIL)**			
PY9.1	Describe and discuss sex determination; sex differentiation and their abnormities and outline psychiatry and practical implication of sex determination.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY9.2	Describe and discuss puberty: onset, progression, stages; early and delayed puberty and outline adolescent clinical and psychological association.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY9.3	Describe male reproductive system: functions of testis and control of spermatogenesis & factors modifying it and outline its association with psychiatric illness	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY9.4	Describe female reproductive system: (a) functions of ovary and its control; (b) menstrual cycle - hormonal, uterine and ovarian changes	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY9.5	Describe and discuss the physiological effects of sex hormones	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY9.6	Enumerate the contraceptive methods for male and female. Discuss their advantages & disadvantages	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Obstetrics & Gynaecology, Community Medicine	
PY9.7	Describe and discuss the effects of removal of gonads on physiological functions	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PY9.8	Describe and discuss the physiology of pregnancy, parturition & lactation and outline the psychology and psychiatry-disorders associated with it.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Obstetrics & Gynaecology	
PY9.9	Interpret a normal semen analysis report including (a) sperm count, (b) sperm morphology and (c) sperm motility, as per WHO guidelines and discuss the results	K	KH	Y	Lecture, Small group discussion	OSPE/Viva voce			
PY9.10	Discuss the physiological basis of various pregnancy tests	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Obstetrics & Gynaecology	
PY9.11	Discuss the hormonal changes and their effects during perimenopause and menopause	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Obstetrics & Gynaecology	
PY9.12	Discuss the common causes of infertility in a couple and role of IVF in managing a case of infertility.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Obstetrics & Gynaecology	
Topic: Neurophysiology		**Number of competencies: (20)**				**Number of procedures that require certification: (09)**			
PY10.1	Describe and discuss the organization of nervous system	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY10.2	Describe and discuss the functions and properties of synapse, reflex, receptors	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY10.3	Describe and discuss somatic sensations & sensory tracts	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY10.4	Describe and discuss motor tracts, mechanism of maintenance of tone, control of body movements, posture and equilibrium & vestibular apparatus	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY10.5	Describe and discuss structure and functions of reticular activating system, autonomic nervous system (ANS)	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY10.6	Describe and discuss Spinal cord, its functions, lesion & sensory disturbances	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PY10.7	Describe and discuss functions of cerebral cortex, basal ganglia, thalamus, hypothalamus, cerebellum and limbic system and their abnormalities	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Psychiatry	Human Anatomy
PY10.8	Describe and discuss behavioural and EEG characteristics during sleep and mechanism responsible for its production	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Psychiatry	
PY10.9	Describe and discuss the physiological basis of memory, learning and speech	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Psychiatry	
PY10.10	Describe and discuss chemical transmission in the nervous system. (Outline the psychiatry element).	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY10.11	Demonstrate the correct clinical examination of the nervous system: Higher functions, sensory system, motor system, reflexes, cranial nerves in a normal volunteer or simulated environment	S	P	Y	DOAP sessions	Skill assessment/ Viva voce/OSCE	1 each (total 5)		Human Anatomy
PY10.12	Identify normal EEG forms	S	S	Y	Small group teaching	OSPE/Viva voce		Psychiatry	
PY10.13	Describe and discuss perception of smell and taste sensation	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		ENT	
PY10.14	Describe and discuss patho-physiology of altered smell and taste sensation	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		ENT	
PY10.15	Describe and discuss functional anatomy of ear and auditory pathways & physiology of hearing	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		ENT	
PY10.16	Describe and discuss pathophysiology of deafness. Describe hearing tests	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		ENT	
PY10.17	Describe and discuss functional anatomy of eye, physiology of image formation, physiology of vision including colour vision, refractive errors, colour blindness, physiology of pupil and light reflex	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Ophthalmology	

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PY10.18	Describe and discuss the physiological basis of lesion in visual pathway	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Ophthalmology	
PY10.19	Describe and discuss auditory & visual evoke potentials	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Ophthalmology	
PY10.20	Demonstrate (i) Testing of visual acuity, colour and field of vision and (ii) hearing (iii) Testing for smell and (iv) taste sensation in volunteer/ simulated environment	S	P	Y	DOAP sessions	Skill assessment/ Viva voce	1 each (total 4)	ENT, Ophthalmology	
Topic: Integrated Physiology		**Number of competencies: (14)**				**Number of procedures that require certification: (NIL)**			
PY11.1	Describe and discuss mechanism of temperature regulation	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY11.2	Describe and discuss adaptation to altered temperature (heat and cold)	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY11.3	Describe and discuss mechanism of fever, cold injuries and heat stroke	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY11.4	Describe and discuss cardio-respiratory and metabolic adjustments during exercise; physical training effects	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY11.5	Describe and discuss physiological consequences of sedentary lifestyle	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY11.6	Describe physiology of Infancy	K	KH	N	Lecture, Small group discussion	Written/Viva voce		Pediatrics	
PY11.7	Describe and discuss physiology of aging; free radicals and antioxidants	K	KH	N	Lecture, Small group discussion	Written/Viva voce			
PY11.8	Discuss & compare cardio-respiratory changes in exercise (isometric and isotonic) with that in the resting state and under different environmental conditions (heat and cold)	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PY11.9	Interpret growth charts	K	KH	N	Small group teaching	Practical/OSPE/ Viva voce		Pediatrics	
PY11.10	Interpret anthropometric assessment of infants	K	KH	N	Small group teaching	Practical/OSPE/ Viva voce		Pediatrics	
PY11.11	Discuss the concept, criteria for diagnosis of Brain death and its implications	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY11.12	Discuss the physiological effects of meditation	K	KH	N	Lecture, Small group discussion	Written/Viva voce			
PY11.13	Obtain history and perform general examination in the volunteer / simulated environment	S	SH	Y	DOAP sessions	Skill assessment/ Viva voce			
PY11.14	Demonstrate Basic Life Support in a simulated environment	S	SH	Y	DOAP sessions	OSCE		General Medicine, Anaesthesiology	
	Column C: K- Knowledge, S – Skill, A - Attitude / professionalism, C- Communication. **Column D: K – Knows, KH - Knows How, SH - Shows how, P- performs independently,** **Column F: DOAP session – Demonstrate, Observe, Assess, Perform.** **Column H: If entry is P: indicate how many procedures must be done independently for certification/ graduation**								
Integration									
	Human Anatomy								
AN3.1	Classify muscle tissue according to structure & action	K	KH	Y	Lecture	Written/ Viva voce			Physiology
AN5.1	Differentiate between blood vascular and lymphatic system	K	KH	Y	Lecture	Written/ Viva voce			Physiology
AN5.2	Differentiate between pulmonary and systemic circulation	K	KH	Y	Lecture	Written/ Viva voce			Physiology
AN5.6	Describe the concept of anastomoses and collateral circulation with significance of end-arteries	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Physiology
AN5.7	Explain function of meta-arterioles, precapillary sphincters, arterio-venous anastomoses	K	KH	N	Lecture	Written			Physiology
AN5.8	Define thrombosis, infarction & aneurysm	K	KH	N	Lecture	Written		Pathology	Physiology

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
AN7.2	List components of nervous tissue and their functions	K	KH	Y	Lecture	Written/ Viva voce			Physiology
AN7.3	Describe parts of a neuron and classify them based on number of neurites, size & function	K	KH	Y	Lecture	Written/ Viva voce			Physiology
AN7.5	Describe principles of sensory and motor innervation of muscles	K	KH	N	Lecture	Written		General Medicine	Physiology
AN7.7	Describe various types of synapse	K	KH	N	Lecture	Written			Physiology
AN21.9	Describe & demonstrate mechanics and types of respiration	K/S	SH	Y	Practical, Lecture, Small group dicussion, DOAP session	Written/Viva voce/ skill assessment			Physiology
AN22.2	Describe & demonstrate external and internal features of each chamber of heart	K/S	SH	Y	Practical, Lecture, Small group dicussion, DOAP session	Written/Viva voce/ skill assessment			Physiology
AN22.3	Describe & demonstrate origin, course and branches of coronary arteries	K/S	SH	Y	Practical, Lecture, Small group dicussion, DOAP session	Written/Viva voce/ skill assessment			Physiology
AN22.4	Describe anatomical basis of ischaemic heart disease	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Physiology
AN22.7	Mention the parts, position and arterial supply of the conducting system of heart	K	KH	Y	Lecture	Written		General Medicine	Physiology
AN24.1	Mention the blood supply, lymphatic drainage and nerve supply of pleura, extent of pleura and describe the pleural recesses and their applied anatomy	K	KH	Y	Practical, Lecture	Written/ Viva voce		General Medicine	Physiology
AN24.2	Identify side, external features and relations of structures which form root of lung & bronchial tree and their clinical correlate	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Medicine	Physiology
AN24.3	Describe a bronchopulmonary segment	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Physiology

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
AN25.3	Describe fetal circulation and changes occurring at birth	K	KH	Y	Lecture	Written		General Medicine	Physiology
AN25.4	Describe embryological basis of: 1) atrial septal defect, 2) ventricular septal defect, 3) Fallot's tetralogy & 4) tracheo-oesophageal fistula	K	KH	Y	Lecture	Written/ Viva voce		General Medicine, Pediatrics	Physiology
AN25.5	Describe developmental basis of congenital anomalies, transposition of great vessels, dextrocardia, patent ductus arteriosus and coarctation of aorta	K	KH	Y	Lecture	Written/ Viva voce		General Medicine, Pediatrics	Physiology
AN25.9	Demonstrate surface marking of lines of pleural reflection, Lung borders and fissures, Trachea, Heart borders, Apex beat & Surface projection of valves of heart	K/S	SH	Y	Practical	Viva voce/ skill assessment		General Medicine, Pediatrics	Physiology
AN56.2	Describe circulation of CSF with its applied anatomy	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Physiology
AN57.4	Enumerate ascending & descending tracts at mid thoracic level of spinal cord	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Physiology
AN57.5	Describe anatomical basis of syringomyelia	K	KH	N	Lecture	Written		General Medicine	Physiology
AN58.3	Enumerate cranial nerve nuclei in medulla oblongata with their functional group	K	KH	Y	Lecture	Written/ Viva voce			Physiology
AN58.4	Describe anatomical basis & effects of medial & lateral medullary syndrome	K	KH	N	Lecture	Written		General Medicine	Physiology
AN59.1	Identify external features of pons	K/S	SH	Y	Lecture, DOAP session	Written/ Viva voce/ skill assessment			Physiology
AN60.3	Describe anatomical basis of cerebellar dysfunction	K	KH	N	Lecture	Written		General Medicine	Physiology
AN61.3	Describe anatomical basis & effects of Benedikt's and Weber's syndromme	K	KH	N	Lecture	Written		General Medicine	Physiology
AN62.2	Describe & demonstrate surfaces, sulci, gyri, poles, & functional areas of cerebral hemisphere	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Medicine	Physiology

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
AN62.3	Describe the white matter of cerebrum	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Physiology
AN62.4	Enumerate parts & major connections of basal ganglia & limbic lobe	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Physiology
AN62.5	Describe boundaries, parts, gross relations, major nuclei and connections of dorsal thalamus, hypothalamus, epithalamus, metathalamus and subthalamus	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Physiology
AN62.6	Describe & identify formation, branches & major areas of distribution of circle of Willis	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Medicine	Physiology
AN63.1	Describe & demonstrate parts, boundaries & features of IIIrd, IVth & lateral ventricle	K/S	SH	Y	Practical, Lecture, Small group dicussion, DOAP session	Written/ Viva voce/ skill assessment			Physiology
AN63.2	Describe anatomical basis of congenital hydrocephalus	K	KH	N	Lecture	Written		Pediatrics	Physiology
AN66.1	Describe & identify various types of connective tissue with functional correlation	K/S	SH	Y	Lecture, Practical	Written/ skill assessment			Physiology
AN67.2	Classify muscle and describe the structure-function correlation of the same	K	KH	Y	Lecture, Practical	Written			Physiology
AN68.2	Describe the structure-function correlation of neuron	K	KH	Y	Lecture, Practical	Written			Physiology
AN69.2	Describe the various types and structure-function correlation of blood vessel	K	KH	Y	Lecture, Practical	Written			Physiology
	Biochemistry								
BI1.1	Describe the molecular and functional organization of a cell and its sub-cellular components.	K	KH	Y	Lecture, Small group discussions	Written assessment and Viva voce			Physiology

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
BI3.7	Describe the common poisons that inhibit crucial enzymes of carbohydrate metabolism (eg; fluoride, arsenate)	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Physiology
BI5.2	Describe and discuss functions of proteins and structure-function relationships in relevant areas eg, hemoglobin and selected hemoglobinopathies	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, General Medicine	Physiology
BI6.3	Describe the common disorders associated with nucleotide metabolism.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Physiology
BI6.7	Describe the processes involved in maintenance of normal pH, water & electrolyte balance of body fluids and the derangements associated with these.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Physiology
BI6.9	Describe the functions of various minerals in the body, their metabolism and homeostasis.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Physiology
BI6.11	Describe the functions of haem in the body and describe the processes involved in its metabolism and describe porphyrin metabolism.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, General Medicine	Physiology
BI6.12	Describe the major types of haemoglobin and its derivatives found in the body and their physiological/ pathological relevance.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, General Medicine	Physiology
BI6.13	Describe the functions of the kidney, liver, thyroid and adrenal glands.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, General Medicine	Physiology, Human Anatomy
BI6.14	Describe the tests that are commonly done in clinical practice to assess the functions of these organs (kidney, liver, thyroid and adrenal glands).	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, General Medicine	Physiology, Human Anatomy
BI6.15	Describe the abnormalities of kidney, liver, thyroid and adrenal glands.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, General Medicine	Physiology, Human Anatomy
BI10.4	Describe & discuss innate and adaptive immune responses, self/non-self recognition and the central role of T-helper cells in immune responses.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Pathology	Physiology
BI11.4	Perform urine analysis to estimate and determine normal and abnormal constituents	S	P	Y	DOAP session	Skill assessment	1	General Medicine	Physiology

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
				Pathology					
PA26.3	Define and describe the etiology, types, pathogenesis, stages, morphology and complications and evaluation of Obstructive airway disease (OAD) and bronchiectasis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, General Medicine	Microbiology
PA27.3	Describe the etiology, types, stages pathophysiology pathology and complications of heart failure	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Physiology	
PA27.8	Interpret abnormalities in cardiac function testing in acute coronary syndromes	S	SH	Y	DOAP session	Skill Assessment		Physiology, General Medicine	
PA27.9	Classify and describe the etiology, types, pathophysiology, pathology, gross and microscopic features, diagnosis and complications of cardiomyopathies	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Physiology	
PA28.5	Define and classify glomerular diseases. Enumerate and describe the etiology, pathogenesis, mechanisms of glomerular injury, pathology, distinguishing features and clinical manifestations of glomerulonephritis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, General Medicine	
PA32.1	Enumerate, classify and describe the etiology, pathogenesis, pathology and iodine dependency of thyroid swellings	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy, Physiology, General Medicine, General Surgery	
PA32.2	Describe the etiology, cause, iodine dependency, pathogenesis, manifestations, laboratory and imaging features and course of thryotoxicosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, General Medicine	
PA32.3	Describe the etiology, pathogenesis, manifestations, laboratory and imaging features and course of thyrotoxicosis/ hypothyroidism	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, General Medicine	
PA32.4	Classify and describe the epidemiology, etiology, pathogenesis, pathology, clinical laboratory features, complications and progression of diabetes mellitus	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, General Medicine	
PA32.5	Describe the etiology, genetics, pathogenesis, manifestations, laboratory and morphologic features of hyperparathyroidism	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Physiology, General Medicine	

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PA32.7	Describe the etiology, pathogenesis, manifestations, laboratory, morphologic features, complications of adrenal insufficiency	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Physiology, General Medicine	
PA32.8	Describe the etiology, pathogenesis, manifestations, laboratory, morphologic features, complications of Cushing's syndrome	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Physiology, General Medicine	
PA32.9	Describe the etiology, pathogenesis, manifestations, laboratory and morphologic features of adrenal neoplasms	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy, Physiology, General Medicine, General Surgery	
				Pharmacology					
PH1.15	Describe mechanism/s of action, types, doses, side effects, indications and contraindications of skeletal muscle relaxants	K	KH	Y	Lecture	Written/ Viva voce		Anesthesiology, Physiology	
PH1.19	Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of the drugs which act on CNS, (including anxiolytics, sedatives & hypnotics, antipsychotic, antidepressant drugs, anti-maniacs,opioid agonists and antagonists, drugs used for neurodegenerative disorders, antiepileptics Drugs)	K	KH	Y	Lecture	Written/ Viva voce		Psychiatry, Physiology	
PH1.25	Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of the drugs acting on blood, like anticoagulants, antiplatelets, fibrinolytics, plasma expanders	K	KH	Y	Lecture	Written/ Viva voce		Physiology, General Medicine	
PH1.26	Describe mechanisms of action, types, doses, side effects, indications and contraindications of the drugs modulating the renin angiotensin and aldosterone system	K	KH	Y	Lecture	Written/ Viva voce		Physiology, General Medicine	
PH1.35	Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of drugs used in hematological disorders like: 1.Drugs used in anemias 2.Colony Stimulating factors	K	KH	Y	Lecture	Written/ Viva voce		General Medicine, Physiology	Pharmacology

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
Forensic Medicine & Toxicology									
FM14.7	Demonstrate & identify that a particular stain is blood and identify the species of its origin.	S	KH	Y	Small group discussion, Lecture	Log book/ skill station/ Viva voce		Pathology, Physiology	
FM14.8	Demonstrate the correct technique to perform and identify ABO & Rh blood group of a person.	S	SH	Y	Small group discussion, DOAP session	Log book/ skill station/ Viva voce		Pathology, Physiology	
Anesthesiology									
AS7.3	Observe and describe the management of an unconscious patient	S	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce		Physiology	General Medicine
AS7.4	Observe and describe the basic setup process of a ventilator	S	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce		Physiology	General Medicine
AS8.1	Describe the anatomical correlates and physiologic principles of pain	K	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce		Human Anatomy, Physiology	
AS8.2	Elicit and determine the level, quality and quantity of pain and its tolerance in patient or surrogate	S	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce		Physiology	
Ophtalmology									
OP1.1	Describe the physiology of vision.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology	
General Medicine									
IM1.1	Describe and discuss the epidemiology, pathogenesis clinical evolution and course of common causes of heart disease including: rheumatic/ valvular, ischemic, hypertrophic inflammatory.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
IM1.2	Describe and discuss the genetic basis of some forms of heart failure	K	KH	N	Lecture, Small group discussion	Written		Pathology, Physiology	
IM1.3	Describe and discuss the aetiology microbiology pathogenies and clinical evolution of rheumatic fever, criteria, degree of rheumatic activity and rheumatic valvular heart disease and its complications including infective endocarditis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology, Microbiology	
IM1.4	Stage heart failure	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM1.5	Describe discuss and differentiate the processes involved in R Vs L heart failure, systolic vs diastolic failure	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM1.6	Describe and discuss the compensatory mechanisms involved in heart failure including cardiac remodelling and neurohormonal adaptations	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM1.7	Enumerate, describe and discuss the factors that exacerbate heart failure including ischemia, arrythmias anemia, thyrotoxicosis, dietary factors drugs etc.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM1.8	Describe and discuss the pathogenesis and development of common arrythmias involved in heart failure particularly atrial fibrillation	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM2.1	Discuss and describe the epidemiology, antecedents and risk factors for atherosclerosis and ischemic heart disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology Community Medicine	
IM2.2	Discuss the aetiology of risk factors both modifiable and non modifiable of atherosclerosis and IHD	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM2.3	Discuss and describe the lipid cycle and the role of dyslipidemia in the pathogenesis of atherosclerosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry	
IM2.4	Discuss and describe the pathogenesis, natural history, evolution and complications of atherosclerosis and IHD	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
IM5.1	Describe and discuss the physiologic and biochemical basis of hyperbilirubinemia	K	K	Y	Lecture, Small group discussion	Written/Viva voce		Pathology, Physiology	
IM5.2	Describe and discuss the aetiology and pathophysiology of liver injury	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM8.1	Describe and discuss the epidemiology, aetiology and the prevalence of primary and secondary hypertension	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM8.2	Describe and discuss the pathophysiology of hypertension	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM11.22	Enumerate the causes of hypoglycaemia and describe the counter hormone response and the initial approach and treatment.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM12.1	Describe the epidemiology and pathogenesis of hypothyroidism and hyperthyroidism including the influence of iodine deficiency and autoimmunity in the pathogenesis of thyroid disease	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM12.3	Describe and discuss the physiology of the hypothalamopituitary - thyroid axis, principles of thyroid function testing and alterations in physiologic function	K	K	Y	Lecture, Small group discussion	short notes		Pathology, Physiology	
IM15.3	Describe and discuss the physiologic effects of acute blood and volume loss	K	K	Y	Lecture, Small group discussions	short note/ Viva voce		Pathology, Physiology	General Surgery
IM18.6	Distinguish the lesion based on upper vs lower motor neuron, side, site and most probable nature of the lesion	K/S	SH	Y	Bedside clinic, DOAP session	Skill Assessment		Physiology	
IM18.7	Describe the clinical features and distinguish, based on clinical examination, the various disorders of speech	K/S	SH	N	Bedside clinic, DOAP session	Skill Assessment		Physiology	
IM18.8	Describe and distinguish, based on the clinical presentation, the types of bladder dysfunction seen in CNS disease	K	KH	Y	Small group discussion, Bedside clinic	Written/ Viva voce		Physiology	
IM19.1	Describe the functional anatomy of the locomotor system of the brain	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Human Anatomy, Physiology	

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
IM22.1	Enumerate the causes of hypercalcemia and distinguish the features of PTH vs non PTH mediated hypercalcemia	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM22.9	Enumerate the causes and describe the clinical and laboratory features of metabolic acidosis	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Physiology	
IM22.10	Enumerate the causes of describe the clinical and laboratory features of metabolic alkalosis	K	KH	N	Lecture, small group discussion	Written/ Viva voce		Physiology	
IM22.11	Enumerate the causes and describe the clinical and laboratory features of respiratory acidosis	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Physiology	
IM22.12	Enumerate the causes and describe the clinical and laboratory features of respiratory alkalosis	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Physiology	
IM22.13	Identify the underlying acid based disorder based on an ABG report and clinical situation	S	KH	N	Lecture, Small group discussion	Written/ Viva voce		Physiology	
IM23.1	Discuss and describe the methods of nutritional assessment in an adult and calculation of caloric requirements during illnesses	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry	Pediatrics
IM23.2	Discuss and describe the causes and consequences of protein caloric malnutrition in the hospital	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry	Pediatrics
IM23.3	Discuss and describe the aetiology, causes, clinical manifestations, complications, diagnosis and management of common vitamin deficiencies	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry	Pediatrics
IM23.4	Enumerate the indications for enteral and parenteral nutrition in critically ill patients	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry	Pediatrics
IM24.22	Describe and discuss the aetiopathogenesis, clinical presentation, complications, assessment and management of nutritional disorders in the elderly	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry	
	Obstetrics & Gynaecology								
OG3.1	Describe the physiology of ovulation, menstruation, fertilization, implantation and gametogenesis	K	K	Y	Lecture, seminars	Theory		Physiology	

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
OG7.1	Describe and discuss the changes in the genital tract, cardiovascular system, respiratory, haematology, renal and gastrointestinal systems in pregnancy	K	KH	Y	Lecture, seminars	Theory		Physiology	
				Pediatrics					
PE7.2	Explain the physiology of lactation	K	KH	Y	Lecture, small group discussion	Written/ Viva voce		Physiology	
PE7.3	Describe the composition and types of breast milk and discuss the differences between cow's milk and human milk	K	KH	Y	Lecture, debate	Written/ Viva voce		Physiology	
PE10.1	Define, describe the etio-pathogenesis, classify including WHO classification, clinical features, complication and management of severe Acute Malnourishment and Moderate Acute Malnutrition	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology Biochemistry	
PE10.2	Outline the clinical approach to a child with SAM and MAM	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry	
PE10.3	Assessment of a patient with SAM and MAM, diagnosis, classification and planning management including hospital and community based intervention, rehabilitation and prevention	S	SH	Y	Bed side clinics, Skill Lab	Skill station		Physiology, Biochemistry	
PE11.1	Describe the common etiology, clinical features and management of Obesity in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry, Pathology	
PE11.2	Discuss the risk approach for obesity and discuss the prevention strategies	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Pathology	
PE12.7	Describe the causes, clinical features, diagnosis and management of Deficiency / excess of Vitamin D (Rickets and Hypervitaminosis D	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, Physiology, Pathology	
PE12.8	Identify the clinical features of dietary deficiency of Vitamin D	S	P	Y	Bedside clinics, Skills lab	Document in log book	3	Biochemistry Physiology Pathology	

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PE12.9	Assess patients with Vitamin D deficiency, diagnose, classify and plan management	S	SH	Y	Bed side clinics	Document in log book		Biochemistry, Physiology, Pathology	
PE12.13	Discuss the RDA, dietary sources of Vitamin K and their role in health and disease	K	K	N	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, Physiology, Pathology	
PE12.14	Describe the causes, clinical features, diagnosis, management and prevention of of Deficiency of Vitamin K	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, Physiology, Pathology	
PE23.1	Discuss the Hemodynamic changes, clinical presentation, complications and management of Acyanotic Heart Diseases –VSD, ASD and PDA	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology Pathology	
PE23.2	Discuss the Hemodynamic changes, clinical presentation, complications and management of Cyanotic Heart Diseases – Fallot's Physiology	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology Pathology	
PE23.3	Discuss the etio-pathogenesis, clinical presentation and management of cardiac failure in infant and children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology Pathology	
PE23.4	Discuss the etio-pathogenesis, clinical presentation and management of Acute Rheumatic Fever in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology Pathology	
PE23.5	Discuss the clinical features, complications, diagnosis, management and prevention of Acute Rheumatic Fever	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology Pathology	
PE23.6	Discuss the etio-pathogenesis and clinical features and management of Infective endocarditis in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Pathology, Microbiology	
PE29.1	Discuss the etio-pathogenesis, Clinical features, classification and approach to a child with anaemia	K	KH	Y	Lecture, Small group discussions	Written/ Viva voce		Pathology, Physiology	
PE29.2	Discuss the etio-pathogenesis, clinical features and management of Iron Deficiency anaemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PE29.3	Discuss the etiopathogenesis, Clinical features and management of VIT B12, Folate deficiency anaemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
PE29.4	Discuss the etio-pathogenesis, clinical features and management of Hemolytic anemia, Thalassemia Major, Sickle cell anaemia, Hereditary spherocytosis, Auto-immune hemolytic anaemia and hemolytic uremic syndrome	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology Physiology	
	General Surgery								
SU1.1	Describe basic concepts of homeostasis, enumerate the metabolic changes in injury and their mediators	K	KH	Y	Lecture, Bed side clinic and Small group discussion	Written/ Viva voce		Physiology, Biochemistry	
SU2.1	Describe Pathophysiology of shock. Types of shock. Principles of resuscitation including fluid replacement and monitoring	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
SU4.1	Elicit, document and present history in a case of Burns and perform physical examination. Describe Pathophysiology of Burns.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology	
SU12.1	Enumerate the causes and consequences of malnutrition in the surgical patient.	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce		Physiology	
SU12.2	Describe and Discuss the methods of estimation and replacement the Fluid and electrolyte requirements in the surgical patient	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce		Physiology	
SU28.5	Describe the applied Anatomy and physiology of esophagus	K	K	Y	Lecture, Small group Discussion, Demonstration	Written/ Viva voce		Human Anatomy, Physiology	
	Respiratory Medicine								

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
CT2.1	Define and classify obstructive airway disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Pathology	
CT2.2	Describe and discuss the epidemiology risk factors and evolution of obstructive airway disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Pathology	
CT2.4	Describe and discuss the physiology and pathophysiology of hypoxia and hypercapneia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Pathology	
CT2.5	Describe and discuss the genetics of alpha 1 antitrypsin deficiency in emphysema	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Physiology, Pathology	
CT2.11	Describe, discuss and interpret pulmonary function tests	S	SH	Y	Bed side clinic, DOAP session	Skill assessment		Physiology, Pathology	

BIOCHEMISTRY (CODE: BI)

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
BIOCHEMISTRY									
Topic: Basic Biochemistry		**Number of competencies: (01)**				**Number of procedures that require certification: (NIL)**			
BI1.1	Describe the molecular and functional organization of a cell and its sub-cellular components.	K	KH	Y	Lecture, Small group discussion	Written assessment/ Viva voce			Physiology
Topic: Enzyme		**Number of competencies: (07)**				**Number of procedures that require certification: (NIL)**			
BI2.1	Explain fundamental concepts of enzyme, isoenzyme, alloenzyme, coenzyme & co-factors. Enumerate the main classes of IUBMB nomenclature.	K	KH	Y	Lecture, case discussion	Written assessment/ Viva voce			
BI2.2	Observe the estimation of SGOT & SGPT	K	K	Y	Demonstration	Viva voce			
BI2.3	Describe and explain the basic principles of enzyme activity	K	KH	Y	Lecture, case discussion	Written/ Viva voce			
BI2.4	Describe and discuss enzyme inhibitors as poisons and drugs and as therapeutic enzymes	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Pathology, General Medicine	
BI2.5	Describe and discuss the clinical utility of various serum enzymes as markers of pathological conditions.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Pathology, General Medicine	
BI2.6	Discuss use of enzymes in laboratory investigations (Enzyme-based assays)	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, General Medicine	
BI2.7	Interpret laboratory results of enzyme activities & describe the clinical utility of various enzymes as markers of pathological conditions.	K	KH	Y	Lecture, Small group discussion, DOAP sessions	Written/ Viva voce		Pathology, General Medicine	
Topic: Chemistry and Metabolism of Carbohydrates		**Number of competencies: (10)**				**Number of procedures that require certification: (NIL)**			
BI3.1	Discuss and differentiate monosaccharides, di-saccharides and polysaccharides giving examples of main carbohydrates as energy fuel, structural element and storage in the human body	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
BI3.2	Describe the processes involved in digestion and assimilation of carbohydrates and storage.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
BI3.3	Describe and discuss the digestion and assimilation of carbohydrates from food.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
BI3.4	Define and differentiate the pathways of carbohydrate metabolism, (glycolysis, gluconeogenesis, glycogen metabolism, HMP shunt).	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		General Medicine	
BI3.5	Describe and discuss the regulation, functions and integration of carbohydrate along with associated diseases/disorders.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		General Medicine	
BI3.6	Describe and discuss the concept of TCA cycle as a amphibolic pathway and its regulation.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
BI3.7	Describe the common poisons that inhibit crucial enzymes of carbohydrate metabolism (eg; fluoride, arsenate)	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Physiology
BI3.8	Discuss and interpret laboratory results of analytes associated with metabolism of carbohydrates.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Pathology, General Medicine	
BI3.9	Discuss the mechanism and significance of blood glucose regulation in health and disease.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		General Medicine	
BI3.10	Interpret the results of blood glucose levels and other laboratory investigations related to disorders of carbohydrate metabolism.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		General Medicine	
Topic: Chemistry and Metabolism of Lipids		**Number of competencies: (07)**				**Number of procedures that require certification: (NIL)**			
BI4.1	Describe and discuss main classes of lipids (Essential/non-essential fatty acids, cholesterol and hormonal steroids, triglycerides, major phospholipids and sphingolipids) relevant to human system and their major functions.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		General Medicine	
BI4.2	Describe the processes involved in digestion and absorption of dietary lipids and also the key features of their metabolism	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
BI4.3	Explain the regulation of lipoprotein metabolism & associated disorders.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI4.4	Describe the structure and functions of lipoproteins, their functions, interrelations & relations with atherosclerosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI4.5	Interpret laboratory results of analytes associated with metabolism of lipids	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI4.6	Describe the therapeutic uses of prostaglandins and inhibitors of eicosanoid synthesis.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI4.7	Interpret laboratory results of analytes associated with metabolism of lipids.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
Topic: Chemistry and Metabolism of Proteins		**Number of competencies: (05)**				**Number of procedures that require certification: (NIL)**			
BI5.1	Describe and discuss structural organization of proteins.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
BI5.2	Describe and discuss functions of proteins and structure-function relationships in relevant areas eg, hemoglobin and selected hemoglobinopathies	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, General Medicine	Physiology
BI5.3	Describe the digestion and absorption of dietary proteins.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	
BI5.4	Describe common disorders associated with protein metabolism.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	
BI5.5	Interpret laboratory results of analytes associated with metabolism of proteins.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
Topic: Metabolism and homeostasis		**Number of competencies: (15)**				**Number of procedures that require certification: (NIL)**			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
BI6.1	Discuss the metabolic processes that take place in specific organs in the body in the fed and fasting states.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI6.2	Describe and discuss the metabolic processes in which nucleotides are involved.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
BI6.3	Describe the common disorders associated with nucleotide metabolism.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Physiology
BI6.4	Discuss the laboratory results of analytes associated with gout & Lesch Nyhan syndrome.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI6.5	Describe the biochemical role of vitamins in the body and explain the manifestations of their deficiency	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI6.6	Describe the biochemical processes involved in generation of energy in cells.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
BI6.7	Describe the processes involved in maintenance of normal pH, water & electrolyte balance of body fluids and the derangements associated with these.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Physiology
BI6.8	Discuss and interpret results of Arterial Blood Gas (ABG) analysis in various disorders.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI6.9	Describe the functions of various minerals in the body, their metabolism and homeostasis.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Physiology
BI6.10	Enumerate and describe the disorders associated with mineral metabolism.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI6.11	Describe the functions of haem in the body and describe the processes involved in its metabolism and describe porphyrin metabolism.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, General Medicine	Physiology

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
BI6.12	Describe the major types of haemoglobin and its derivatives found in the body and their physiological/ pathological relevance.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, General Medicine	Physiology
BI6.13	Describe the functions of the kidney, liver, thyroid and adrenal glands.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, General Medicine	Physiology, Human Anatomy
BI6.14	Describe the tests that are commonly done in clinical practice to assess the functions of these organs (kidney, liver, thyroid and adrenal glands).	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, General Medicine	Physiology, Human Anatomy
BI6.15	Describe the abnormalities of kidney, liver, thyroid and adrenal glands.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, General Medicine	Physiology, Human Anatomy
Topic: Molecular biology		**Number of competencies: (07)**				**Number of procedures that require certification: (NIL)**			
BI7.1	Describe the structure and functions of DNA and RNA and outline the cell cycle.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
BI7.2	Describe the processes involved in replication & repair of DNA and the transcription & translation mechanisms.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
BI7.3	Describe gene mutations and basic mechanism of regulation of gene expression.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	
BI7.4	Describe applications of molecular technologies like recombinant DNA technology, PCR in the diagnosis and treatment of diseases with genetic basis.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics, General Medicine	
BI7.5	Describe the role of xenobiotics in disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
BI7.6	Describe the anti-oxidant defence systems in the body.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
BI7.7	Describe the role of oxidative stress in the pathogenesis of conditions such as cancer, complications of diabetes mellitus and atherosclerosis.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Pathology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
Topic: Nutrition		**Number of competencies: (05)**			**Number of procedures that require certification: (NIL)**				
BI8.1	Discuss the importance of various dietary components and explain importance of dietary fibre.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Pediatrics, Pathology	
BI8.2	Describe the types and causes of protein energy malnutrition and its effects.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Pediatrics, Pathology	
BI8.3	Provide dietary advice for optimal health in childhood and adult, in disease conditions like diabetes mellitus, coronary artery disease and in pregnancy.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI8.4	Describe the causes (including dietary habits), effects and health risks associated with being overweight/ obesity.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Pathology	
BI8.5	Summarize the nutritional importance of commonly used items of food including fruits and vegetables.(macro-molecules & its importance)	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine, General Medicine, Pediatrics	
Topic: Extracellular Matrix		**Number of competencies: (03)**			**Number of procedures that require certification: (NIL)**				
BI9.1	List the functions and components of the extracellular matrix (ECM).	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
BI9.2	Discuss the involvement of ECM components in health and disease.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI9.3	Describe protein targeting & sorting along with its associated disorders.	K	KH	N	Lecture, Small group discussion	Written/ Viva voce			
Topic: Oncogenesis and immunity		**Number of competencies: (05)**			**Number of procedures that require certification: (NIL)**				

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
BI10.1	Describe the cancer initiation, promotion oncogenes & oncogene activation. Also focus on p53 & apoptosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology, General Surgery, Pathology	
BI10.2	Describe various biochemical tumor markers and the biochemical basis of cancer therapy.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology, General Surgery, Pathology	
BI10.3	Describe the cellular and humoral components of the immune system & describe the types and structure of antibody	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology, General Surgery, Pathology	
BI10.4	Describe & discuss innate and adaptive immune responses, self/non-self recognition and the central role of T-helper cells in immune responses.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Pathology	Physiology
BI10.5	Describe antigens and concepts involved in vaccine development.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Pediatrics, Microbiology	
Topic: Biochemical Laboratory Tests		**Number of competencies: (24)**				**Number of procedures that require certification: (05)**			
BI11.1	Describe commonly used laboratory apparatus and equipments, good safe laboratory practice and waste disposal.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
BI11.2	Describe the preparation of buffers and estimation of pH.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
BI11.3	Describe the chemical components of normal urine.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
BI11.4	Perform urine analysis to estimate and determine normal and abnormal constituents	S	P	Y	DOAP session	Skill assessment	1	General Medicine	Physiology

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
BI11.5	Describe screening of urine for inborn errors & describe the use of paper chromatography	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI11.6	Describe the principles of colorimetry	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
BI11.7	Demonstrate the estimation of serum creatinine and creatinine clearance	S	P	Y	Practical	Skills assessment	1		
BI11.8	Demonstrate estimation of serum proteins, albumin and A:G ratio	S	P	Y	Practical	Skills assessment	1		
BI11.9	Demonstrate the estimation of serum total cholesterol and HDL-cholesterol	S	P	Y	Practical	Skills assessment			
BI11.10	Demonstrate the estimation of triglycerides	S	P	Y	Practical	Skills assessment			
BI11.11	Demonstrate estimation of calcium and phosphorous	S	P	Y	Practical	Skills assessment			
BI11.12	Demonstrate the estimation of serum bilirubin	S	P	Y	Practical	Skills assessment			
BI11.13	Demonstrate the estimation of SGOT/ SGPT	S	P	Y	Practical	Skills assessment			
BI11.14	Demonstrate the estimation of alkaline phosphatase	S	P	Y	Practical	Skills assessment			
BI11.15	Describe & discuss the composition of CSF	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
BI11.16	Observe use of commonly used equipments/techniques in biochemistry laboratory including: •pH meter •Paper chromatography of amino acid •Protein electrophoresis •TLC, PAGE •Electrolyte analysis by ISE •ABG analyzer •ELISA •Immunodiffusion •Autoanalyser •Quality control •DNA isolation from blood/ tissue	S	KH	Y	Demonstration	Skill assessment			
BI11.17	Explain the basis and rationale of biochemical tests done in the following conditions: - diabetes mellitus, - dyslipidemia, - myocardial infarction, - renal failure, gout, - proteinuria, - nephrotic syndrome, - edema, - jaundice, - liver diseases, pancreatitis, disorders of acid- base balance, - thyroid disorders.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Pathology	
BI11.18	Discuss the principles of spectrophotometry.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
BI11.19	Outline the basic principles involved in the functioning of instruments commonly used in a biochemistry laboratory and their applications.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
BI11.20	Identify abnormal constituents in urine, interpret the findings and correlate these with pathological states.	S	SH	Y	DOAP sessions	Skill assessment	1		

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
BI11.21	Demonstrate estimation of glucose, creatinine, urea and total protein in serum.	S	SH	Y	DOAP sessions	Skill assessment	1		
BI11.22	Calculate albumin: globulin (AG) ratio and creatinine clearance	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI11.23	Calculate energy content of different food Items, identify food items with high and low glycemic index and explain the importance of these in the diet	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI11.24	Enumerate advantages and/or disadvantages of use of unsaturated, saturated and trans fats in food.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
	Column C: K- Knowledge, S – Skill, A - Attitude / professionalism, C- Communication. **Column D: K – Knows, KH - Knows How, SH - Shows how, P- performs independently,** **Column F: DOAP session – Demonstrate, Observe, Assess, Perform.** **Column H: If entry is P: indicate how many procedures must be done independently for certification/ graduation**								
Integration									
	Physiology								
PY3.11	Explain energy source and muscle metabolism	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Biochemistry
PY4.2	Describe the composition, mechanism of secretion, functions, and regulation of saliva, gastric, pancreatic, intestinal juices and bile secretion	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Biochemistry
PY4.4	Describe the physiology of digestion and absorption of nutrients	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Biochemistry
PY4.7	Describe & discuss the structure and functions of liver and gall bladder	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Biochemistry

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
PY4.8	Describe & discuss gastric function tests, pancreatic exocrine function tests & liver function tests	K	KH	Y	Lecture, Small group discussion, Demonstration Esophageal Manometry & endoscopy	Written/Viva voce			Biochemistry
PY4.9	Discuss the physiology aspects of: peptic ulcer, gastro-oesophageal reflux disease, vomiting, diarrhoea, constipation, Adynamic ileus, Hirschsprung's disease	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		General Medicine	Biochemistry
PY7.8	Describe & discuss Renal Function Tests	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Biochemistry
PY8.4	Describe function tests: Thyroid gland; Adrenal cortex, Adrenal medulla and pancreas	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Biochemistry

Pathology

PA12.2	Describe the pathogenesis of disorders caused by protein calorie malnutrition and starvation	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, Pediatrics	
PA14.1	Describe iron metabolism	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PA15.1	Describe the metabolism of Vitamin B12 and the etiology and pathogenesis of B12 deficiency	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, General Medicine	
PA16.1	Define and classify hemolytic anemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, General Medicine	
PA16.2	Describe the pathogenesis and clinical features and hematologic indices of hemolytic anemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, General Medicine	
PA16.3	Describe the pathogenesis, features, hematologic indices and peripheral blood picture of sickle cell anemia and thalassemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, General Medicine	
PA16.4	Describe the etiology, pathogenesis, hematologic indices and peripheral blood picture of Acquired hemolytic anemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, General Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
PA25.1	Describe bilirubin metabolism, enumerate the etiology and pathogenesis of jaundice, distinguish between direct and indirect hyperbilirubinemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, General Medicine	

Dermatology, Venereology & Leprosy

DR17.1	Enumerate and identify the cutaneous findings in Vitamin A deficiency	K/S	SH	Y	Lecture, Small group discussion, Bedside clinic	Skill assessment Viva voce		General Medicine, Pediatrics, Biochemistry	
DR17.2	Enumerate and describe the various skin changes in Vitamin B complex deficiency	K	KH	Y	Lecture	Written/ Viva voce		General Medicine Pediatrics, Biochemistry	
DR17.3	Enumerate and describe the various changes in Vitamin C deficiency	K	KH	Y	Lecture	Written/ Viva voce		General Medicine, Pediatrics, Biochemistry	
DR17.4	Enumerate and describe the various changes in Zinc deficiency	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Pediatrics, Biochemistry	

Ophthalmology

OP7.1	Describe the surgical anatomy and the metabolism of the lens	K	KH	Y	Lecture,Small group discussion	Written/ Viva voce		Biochemistry, Human Anatomy	

General Medicine

IM2.3	Discuss and describe the lipid cycle and the role of dyslipidemia in the pathogenesis of atherosclerosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry	
IM2.12	Choose and interpret a lipid profile and identify the desirable lipid profile in the clinical context	S	SH	Y	Bed side clinic, DOAP session	Skill assessment		Biochemistry	
IM2.18	Discuss and describe the indications, formulations, doses, side effects and monitoring for drugs used in the management of dyslipidemia	K	KH	Y	Lecture Small group discussion	Written/ Viva voce		Pharmacology, Biochemistry	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
IM11.12	Perform and interpret a capillary blood glucose test	S	P	Y	Bed side clinic, DOAP session	Skill assessment	2	Pathology, Biochemistry	
IM11.13	Perform and interpret a urinary ketone estimation with a dipstick	S	P	Y	Bed side clinic, DOAP session	Skill assessment	2	Pathology, Biochemistry	
IM13.1	Describe the clinical epidemiology and inherited & modifiable risk factors for common malignancies in India	K	K	Y	Lecture, Small group discussion	short note/ Viva voce		Pathology, Biochemistry	
IM23.1	Discuss and describe the methods of nutritional assessment in an adult and calculation of caloric requirements during illnesses	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry	Pediatrics
IM23.2	Discuss and describe the causes and consequences of protein caloric malnutrition in the hospital	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry	Pediatrics
IM23.3	Discuss and describe the aetiology, causes, clinical manifestations, complications, diagnosis and management of common vitamin deficiencies	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry	Pediatrics
IM23.4	Enumerate the indications for enteral and parenteral nutrition in critically ill patients	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry	Pediatrics
IM24.22	Describe and discuss the aetiopathogenesis, clinical presentation, complications, assessment and management of nutritional disorders in the elderly	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry	

Pediatrics

PE9.1	Describe the age related nutritional needs of infants, children and adolescents including micronutrients and vitamins	K	KH	Y	Lecture, Small Group discussion	Written/ Viva voce		Community Medicine, Biochemistry	
PE9.3	Explains the Calorific value of common Indian foods	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE10.1	Define Describe the etio-pathogenesis , Classify including WHO classification , clinical features, complication and management of Severe Acute Malnourishment (SAM) and Moderate Acute Malnutrition (MAM)	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
PE10.2	Outline the clinical approach to a child with SAM and MAM	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry	
PE10.3	Assessment of a patient with SAM and MAM, diagnosis, classification and planning management including hospital and community based intervention, rehabilitation and prevention	S	SH	Y	Bed side clinics, Skill Lab	Skill station		Physiology, Biochemistry	
PE11.1	Describe the common etiology, clinical features and management of Obesity in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry, Pathology	
PE12.1	Discuss the (RDA) , dietary sources of Vitamin A and their role in Health and disease	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE12.2	Describe the causes, clinical features, diagnosis and management of Deficiency / excess of Vitamin A	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE12.3	Identify the clinical features of dietary deficiency / excess of Vitamin A	S	SH	Y	Bed side clinics, Small group discussion	Document in log book		Biochemistry	
PE12.4	Diagnose patients with Vitamin A deficiency, Classify and plan management	S	SH	N	Bed side clinics, Skill Station	Document in log book		Biochemistry	
PE12.5	Discuss the Vitamin A prophylaxis program and their recommendations	K	K	Y	Lecture, Small group Discussion	Written/ Viva voce		Biochemistry	
PE12.6	Discuss the RDA, dietary sources of Vitamin D and their role in Health and disease	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE12.7	Describe the causes, clinical features, diagnosis and management of Deficiency / excess of Vitamin D (Rickets and Hypervitaminosis D)	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, Physiology, Pathology	
PE12.8	Identify the clinical features of dietary deficiency of Vitamin D	S	SH	Y	Bedside clinics, Skills lab	Document in log book		Biochemistry, Physiology, Pathology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
PE12.9	Assess patients with Vitamin D deficiency, Diagnose, Classify and plan management	S	SH	Y	Bed side clinics	Document in log book		Biochemistry, Physiology, Pathology	
PE12.11	Discuss the RDA, dietary sources of Vitamin E and their role in Health and disease	K	K	N	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE12.12	Describe the causes, clinical features, diagnosis and management of deficiency of Vitamin E	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE12.13	Discuss the RDA , dietary sources of Vitamin K and their role in Health and disease	K	K	N	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, Physiology, Pathology	
PE12.14	Describe the causes, clinical features, diagnosis , management and prevention of Deficiency of Vitamin K	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, Physiology, Pathology	
PE12.15	Discuss the RDA , dietary sources of Vitamin B and their role in Health and disease	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE12.16	Describe the causes, clinical features, diagnosis and management of Deficiency of B complex Vitamins	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE12.17	Identify the clinical features of Vitamin B complex deficiency	S	SH	Y	Bedside clinics, Skills lab	Document in log book		Biochemistry	
PE12.18	Diagnose patients with Vitamin B complex deficiency and plan management	S	SH	Y	Bed side clinics, Skill lab	Document in log book		Biochemistry	
PE12.19	Discuss the RDA, dietary sources of Vitamin C and their role in Health and disease	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE12.20	Describe the causes, clinical features, diagnosis and management of Deficiency of Vitamin C (scurvy)	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE12.21	Identify the clinical features Vitamin C deficiency	S	SH	N	Bed side clinics, Skill lab	Document in log book		Biochemistry	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
PE13.1	Discuss the RDA, dietary sources of Iron and their role in health and disease	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Biochemistry	
PE13.2	Describe the causes, diagnosis and management of Fe deficiency	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Biochemistry	
PE13.3	Identify the clinical features of dietary deficiency of Iron and make a diagnosis	S	SH	Y	Bed side clinics, Skill Lab	Document in log book		Pathology, Biochemistry	
PE13.4	Interpret hemogram and Iron Panel	S	SH	Y	Bed side clinic, Small group discussion	Skill Assessment		Pathology, Biochemistry	
PE13.7	Discuss the RDA , dietary sources of Iodine and their role in Health and disease	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE13.8	Describe the causes, clinical features, diagnosis and management of Deficiency of Iodine	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE13.9	Identify the clinical features of Iodine deficiency disorders	S	SH	N	Lecture, Bed side clinic	Written/ Viva voce		Biochemistry	
PE13.10	Discuss the National Goiter control program and their recommendations	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, Community Medicine	
PE13.11	Discuss the RDA, dietary sources of Calcium and its role in Health and disease	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE13.12	Describe the causes, clinical features, diagnosis and management of Ca Deficiency	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE13.13	Discuss the RDA , dietary sources of Magnesium and their role in Health and disease	K	K	N	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE13.14	Describe the causes, clinical features, diagnosis and management of Magnesium Deficiency	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE19.1	Explain the components of the Universal immunization Program and the sub National Immunization Programs	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine, Microbiology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
PE19.2	Explain the epidemiology of Vaccine preventable diseases	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine, Microbiology	
PE19.3	Vaccine description with regards to Classification of vaccines, Strain used, Dose, route, schedule, Risks benefits and side effects, indications and contraindications	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine, Microbiology	
PE19.4	Define cold chain and discuss the methods of safe storage and handling of vaccines	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine, Microbiology	
PE19.5	Discuss immunization in special situations – HIV positive children, immunodeficiency, preterm, organ transplants, those who received blood and blood products, splenectomised children, Adolescents, travellers	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine, Microbiology	
PE21.11	Perform and interpret the common analytes in a Urine examination	S	SH	Y	Bed side clinic Labs, Skill lab	Skill assessment		Biochemistry, Pathology	
PE29.16	Discuss the Indications for Hemoglobin electrophoresis and interpret report	K	K	N	Small group discussion	Viva voce		Biochemistry	
PE33.6	Perform and interpret Urine Dip Stick for Sugar	S	P	Y	DOAP session	Skill assessment	3	Biochemistry	

General Surgery

SU1.1	Describe basic concepts of homeostasis, enumerate the metabolic changes in injury and their mediators.	K	KH	Y	Lecture, Bed side clinic and Small group discussion.	Written/ Viva voce.		Physiology, Biochemistry	
SU1.2	Describe the factors that affect the metabolic response to injury.	K	KH	Y	Lecture, Bed side clinic and Small group discussion.	Written/ Viva voce.		Biochemistry	
SU9.1	Choose appropriate biochemical, microbiological, pathological, imaging investigations and interpret the investigative data in a surgical patient.	K	KH	Y	Lecture, Small group discussion.	Written/ Viva voce		Biochemistry, Microbiology, Pathology	
SU12.3	Discuss the nutritional requirements of surgical patients, the methods of providing nutritional support and their complications.	K	KH	Y	Lecture, Small group discussion, Bedside clinic discussion	Written/ Viva voce		Biochemistry	

PHARMACOLOGY (CODE: PH)

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PHARMACOLOGY									
KNOWLEDGE: Topic: Pharmacology		**Number of competencies: (64)**			**Number of procedures that require certification : (NIL)**				
PH1.1	Define and describe the principles of pharmacology and pharmacotherapeutics	K	K	Y	Lecture	Written/ Viva voce			
PH1.2	Describe the basis of Evidence based medicine and Therapeutic drug monitoring	K	KH	Y	Lecture	Written/ Viva voce			
PH1.3	Enumerate and identify drug formulations and drug delivery systems	K/S	SH	Y	Lecture, Practical	Written/ Viva voce			
PH1.4	Describe absorption, distribution, metabolism & excretion of drugs	K	KH	Y	Lecture, Small Group discussion	Written/ Viva voce			
PH1.5	Describe general principles of mechanism of drug action	K	KH	Y	Lecture, Small Group discussion	Written/ Viva voce			
PH1.6	Describe principles of Pharmacovigilance & ADR reporting systems	K	KH	Y	Lecture, Practical	Written/ Viva voce			
PH1.7	Define, identify and describe the management of adverse drug reactions (ADR)	K/S	KH	Y	Lecture, Practical	Written/ Viva voce			
PH1.8	Identify and describe the management of drug interactions	K/S	KH	Y	Lecture, Practical	Written/ Viva voce			
PH1.9	Describe nomenclature of drugs i.e. generic, branded drugs	K/S	SH	Y	Lecture, Practical	Written/ Viva voce			
PH1.10	Describe parts of a correct, complete and legible generic prescription. Identify errors in prescription and correct appropriately	K/S	SH	Y	Lecture, Practical	Written/ Viva voce			
PH1.11	Describe various routes of drug administration, eg., oral, SC, IV, IM, SL	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PH1.12	Calculate the dosage of drugs using appropriate formulae for an individual patient, including children, elderly and patient with renal dysfunction.	K/S	SH	Y	Lecture, practical	Written/ Viva voce		Pediatrics, General Medicine	
PH1.13	Describe mechanism of action, types, doses, side effects, indications and contraindications of adrenergic and anti-adrenergic drugs	K	KH	Y	Lecture, Small Group discussion	Written/ Viva voce			
PH1.14	Describe mechanism of action, types, doses, side effects, indications and contraindications of cholinergic and anticholinergic drugs	K	KH	Y	Lecture, Small Group discussion	Written/ Viva voce			
PH1.15	Describe mechanism/s of action, types, doses, side effects, indications and contraindications of skeletal muscle relaxants	K	KH	Y	Lecture	Written/ Viva voce		Anesthesiology, Physiology	
PH1.16	Describe mechanism/s of action, types, doses, side effects, indications and contraindications of the drugs which act by modulating autacoids, including: anti-histaminics, 5-HT modulating drugs, NSAIDs, drugs for gout, anti-rheumatic drugs, drugs for migraine	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	
PH1.17	Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of local anesthetics	K	KH	Y	Lecture	Written/ Viva voce		Anesthesiology	
PH1.18	Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of general anaesthetics, and pre-anesthetic medications	K	KH	Y	Lecture	Written/ Viva voce		Anesthesiology	
PH1.19	Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of the drugs which act on CNS, (including anxiolytics, sedatives & hypnotics, anti-psychotic, anti-depressant drugs, anti-maniacs, opioid agonists and antagonists, drugs used for neurodegenerative disorders, anti-epileptics drugs)	K	KH	Y	Lecture	Written/ Viva voce		Psychiatry, Physiology	
PH1.20	Describe the effects of acute and chronic ethanol intake	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Psychiatry	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PH1.21	Describe the symptoms and management of methanol and ethanol poisonings	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PH1.22	Describe drugs of abuse (dependence, addiction, stimulants, depressants, psychedelics, drugs used for criminal offences)	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Psychiatry	Forensic Medicine
PH1.23	Describe the process and mechanism of drug deaddiction	K/S	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Psychiatry	
PH1.24	Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of the drugs affecting renal systems including diuretics, antidiuretics- vasopressin and analogues	K	KH	Y	Lecture	Written/ Viva voce			
PH1.25	Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of the drugs acting on blood, like anticoagulants, antiplatelets, fibrinolytics, plasma expanders	K	KH	Y	Lecture	Written/ Viva voce		Physiology, General Medicine	
PH1.26	Describe mechanisms of action, types, doses, side effects, indications and contraindications of the drugs modulating the renin-angiotensin and aldosterone system	K	KH	Y	Lecture	Written/ Viva voce		Physiology, General Medicine	
PH1.27	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of antihypertensive drugs and drugs used in shock	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	
PH1.28	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of the drugs used in ischemic heart disease (stable, unstable angina and myocardial infarction), peripheral vascular disease	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	
PH1.29	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of the drugs used in congestive heart failure	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	
PH1.30	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of the antiarrhythmics	K	KH	N	Lecture	Written/ Viva voce		General Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PH1.31	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of the drugs used in the management of dyslipidemias	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PH1.32	Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of drugs used in bronchial asthma and COPD	K	KH	Y	Lecture, Small Group discussion	Written/ Viva voce		Respiratory Medicine	
PH1.33	Describe the mechanism of action, types, doses, side effects, indications and contraindications of the drugs used in cough (antitussives, expectorants/ mucolytics)	K	KH	Y	Lecture, Small Group discussion	Written/ Viva voce		Respiratory Medicine	
PH1.34	Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of the drugs used as below: 1. Acid-peptic disease and GERD 2. Antiemetics and prokinetics 3. Antidiarrhoeals 4 .Laxatives 5. Inflammatory Bowel Disease 6. Irritable Bowel Disorders, biliary and pancreatic diseases	K	KH	Y	Lecture, Small Group discussion	Written/ Viva voce		General Medicine	
PH1.35	Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of drugs used in hematological disorders like: 1.Drugs used in anemias 2.Colony Stimulating factors	K	KH	Y	Lecture	Written/ Viva voce		General Medicine, Physiology	Pharmacology
PH1.36	Describe the mechanism of action, types, doses, side effects, indications and contraindications of drugs used in endocrine disorders (diabetes mellitus, thyroid disorders and osteoporosis)	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	
PH1.37	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of the drugs used as sex hormones, their analogues and anterior Pituitary hormones	K	KH	Y	Lecture	Written/ Viva voce			
PH1.38	Describe the mechanism of action, types, doses, side effects, indications and contraindications of corticosteroids	K	KH	Y	Lecture	Written/ Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PH1.39	Describe mechanism of action, types, doses, side effects, indications and contraindications the drugs used for contraception	K	KH	Y	Lecture	Written/ Viva voce		Obstetrics & Gynaecology	
PH1.40	Describe mechanism of action, types, doses, side effects, indications and contraindications of 1. Drugs used in the treatment of infertility, and 2. Drugs used in erectile dysfunction	K	KH	Y	Lecture	Written/ Viva voce		Obstetrics & Gynaecology	
PH1.41	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of uterine relaxants and stimulants	K	KH	Y	Lecture	Written/ Viva voce		Obstetrics & Gynaecology	
PH1.42	Describe general principles of chemotherapy	K	KH	Y	Lecture	Written/ Viva voce			
PH1.43	Describe and discuss the rational use of antimicrobials including antibiotic stewardship program	K	KH	Y	Lecture	Written/ Viva voce		General Medicine, Pediatrics	Microbiology
PH1.44	Describe the first line antitubercular dugs, their mechanisms of action, side effects and doses.	K	KH	Y	Lecture	Written/ Viva voce		Respiratory Medicine	
PH1.45	Describe the dugs used in MDR and XDR Tuberculosis	K	KH	Y	Lecture	Written/ Viva voce		Respiratory Medicine	Microbiology
PH1.46	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of antileprotic drugs	K	KH	Y	Lecture	Written/ Viva voce		Dermatology, Venereology & Leprosy	Microbiology
PH1.47	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of the drugs used in malaria, KALA-AZAR, amebiasis and intestinal helminthiasis	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Microbiology
PH1.48	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of the drugs used in UTI/ STD and viral diseases including HIV	K	KH	Y	Lecture	Written/Viva voce			Microbiology
PH1.49	Describe mechanism of action, classes, side effects, indications and contraindications of anticancer drugs	K	KH	Y	Lecture	Written/Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PH1.50	Describe mechanisms of action, types, doses, side effects, indications and contraindications of immunomodulators and management of organ transplant rejection	K	KH	Y	Lecture	Written/ Viva voce			
PH1.51	Describe occupational and environmental pesticides, food adulterants, pollutants and insect repellents	K	KH/	Y	Lecture	Written/ Viva voce			
PH1.52	Describe management of common poisoning, insecticides, common sting and bites	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	
PH1.53	Describe heavy metal poisoning and chelating agents	K	KH	N	Lecture	Written/ Viva voce			
PH1.54	Describe vaccines and their uses	K	KH	Y	Lecture	Written/ Viva voce			
PH1.55	Describe and discuss the following National Health Programmes including Immunisation, Tuberculosis, Leprosy, Malaria, HIV, Filaria, Kala Azar, Diarrhoeal diseases, Anaemia & nutritional disorders, Blindness, Non-communicable diseases, cancer and Iodine deficiency	K	KH	Y	Lecture	Written/ Viva voce			Community Medicine
PH1.56	Describe basic aspects of Geriatric and Pediatric pharmacology	K	KH	Y	Lecture	Written/ Viva voce		Pediatrics	
PH1.57	Describe drugs used in skin disorders	K	KH	Y	Lecture	Written/ Viva voce		Dermatology, Venereology & Leprosy	
PH1.58	Describe drugs used in Ocular disorders	K	KH	Y	Lecture	Written/ Viva voce		Ophthalmology	
PH1.59	Describe and discuss the following: Essential medicines, Fixed dose combinations, Over the counter drugs, Herbal medicines	K	KH	Y	Lecture	Written/ Viva voce			
PH1.60	Describe and discuss Pharmacogenomics and Pharmacoeconomics	K	KH	N	Lecture	Written/ Viva voce			
PH1.61	Describe and discuss dietary supplements and nutraceuticals	K	KH	N	Lecture	Written/ Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PH1.62	Describe and discuss antiseptics and disinfectants	K	KH	Y	Lecture	Written/ Viva voce			
PH1.63	Describe Drug Regulations, acts and other legal aspects	K	KH	Y	Lecture	Written/ Viva voce			
PH1.64	Describe overview of drug development, Phases of clinical trials and Good Clinical Practice	K	KH	Y	Lecture	Written/ Viva voce			
SKILLS: Topic: Clinical Pharmacy		**Number of competencies: (04)**				**Number of procedures that require certification : (NIL)**			
PH2.1	Demonstrate understanding of the use of various dosage forms (oral/local/parenteral; solid/liquid)	S/C	SH	Y	DOAP sessions	Skills assessment			
PH2.2	Prepare oral rehydration solution from ORS packet and explain its use	S/C	SH	Y	DOAP sessions	Skills assessment			
PH2.3	Demonstrate the appropriate setting up of an intravenous drip in a simulated environment	S	SH	Y	DOAP sessions	Skills assessment			
PH2.4	Demonstrate the correct method of calculation of drug dosage in patients including those used in special situations	S	SH	Y	DOAP sessions	Skills assessment		Pediatrics, General Medicine	
SKILLS: Topic: Clinical Pharmacology		**Number of competencies: (08)**				**Number of procedures that require certification : (04)**			
PH3.1	Write a rational, correct and legible generic prescription for a given condition and communicate the same to the patient	S/C	P	Y	Skill station	Skill station	5	General Medicine	
PH3.2	Perform and interpret a critical appraisal (audit) of a given prescription	S	P	Y	Skill Lab	Maintenance of log book	3		
PH3.3	Perform a critical evaluation of the drug promotional literature	S	P	Y	Skill Lab	Maintenance of log book/ Skill station	3	General Medicine	
PH3.4	To recognise and report an adverse drug reaction	S	SH	Y	Skill station	Maintenance of log book/ Skill station			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PH3.5	To prepare and explain a list of P-drugs for a given case/condition	S	P	Y	Skill station	Maintenance of log book	3	General Medicine	
PH3.6	Demonstrate how to optimize interaction with pharmaceutical representative to get authentic information on drugs	S	SH	N	Skill station	maintenance of log book			
PH3.7	Prepare a list of essential medicines for a healthcare facility	S	SH	Y	Skill station	Maintenance of log book			
PH3.8	Communicate effectively with a patient on the proper use of prescribed medication	C/A	SH	Y	Skill Lab	Skill station			
SKILLS: Topic: Experimental Pharmacology		**Number of competencies: (02)**				**Number of procedures that require certification :(NIL)**			
PH4.1	Administer drugs through various routes in a simulated environment using mannequins	S	SH	Y	DOAP sessions	Skills assessment			
PH4.2	Demonstrate the effects of drugs on blood pressure (vasopressor and vaso-depressors with appropriate blockers) using computer aided learning	S	SH	Y	Skill lab	Skill station			
Communication Topic: Pharmacology		**Number of competencies: (07)**				**Number of procedures that require certification : (NIL)**			
PH5.1	Communicate with the patient with empathy and ethics on all aspects of drug use	A/C	SH	Y	Small group discussion	skill station		General Medicine	
PH5.2	Communicate with the patient regarding optimal use of a) drug therapy, b) devices and c) storage of medicines	A/C	SH	Y	Small group discussion	Skill station			
PH5.3	Motivate patients with chronic diseases to adhere to the prescribed management by the health care provider	A/C	SH	Y	Small group discussion	short note/skill station			
PH5.4	Explain to the patient the relationship between cost of treatment and patient compliance	A/C	SH	Y	Small group discussion	short note/ viva voce		General Medicine	
PH5.5	Demonstrate an understanding of the caution in prescribing drugs likely to produce dependence and recommend the line of management	K	KH	Y	Small group discussion	short note/ Viva voce		Psychiatry	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PH5.6	Demonstrate ability to educate public & patients about various aspects of drug use including drug dependence and OTC drugs	A/C	SH	Y	Small group discussion	Skill station		Psychiatry	
PH5.7	Demonstrate an understanding of the legal and ethical aspects of prescribing drugs	K	KH	Y	Small group discussion	short note/ Viva voce			Forensic Medicine

Column C: K- Knowledge, S – Skill, A - Attitude / professionalism, C- Communication.
Column D: K – Knows, KH - Knows How, SH - Shows how, P- performs independently,
Column F: DOAP session – Demonstrate, Observe, Assess, Perform.
Column H: If entry is P: indicate how many procedures must be done independently for certification/ graduation

Integration

					Physiology				
PY3.5	Discuss the action of neuro-muscular blocking agents	K	KH	Y	Lectures, Small group discussion	Written/ Viva voce		Anaesthesiology, Pharmacology	
					Microbiology				
MI1.6	Describe the mechanisms of drug resistance, methods of antimicrobial susceptibility testing and monitoring of antimicrobial therapy.	K	K	Y	Lecture , Small group discussion	Written Viva			Pharmacology
MI3.3	Describe the enteric fever pathogens and discuss the evolution of the clinical course, the laboratory diagnosis of the diseases caused by them	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Pharmacology, Pathology
MI3.5	Enumerate the causative agents of food poisoning and discuss the pathogenesis, clinical course and laboratory diagnosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Pharmacology
MI3.6	Describe the etio-pathogenesis of Acid Peptic Disease (APD) and the clinical course. Discuss the diagnosis and management of the causative agent of APD	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Pharmacology, Pathology
					Community Medicine				

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
CM3.8	Describe the mode of action & application cycle of commonly used insecticides and rodenticides	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
CM19.1	Define and describe the concept of Essential Medicine List (EML)	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Pharmacology
CM19.2	Describe roles of essential medicine in primary health care	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Pharmacology
CM19.3	Describe counterfeit medicine and its prevention	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Pharmacology
	Forensic Medicine & Toxicology								
FM4.11	Describe and discuss euthanasia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM	Pharmacology
FM4.12	Discuss legal and ethical issues in relation to stem cell research	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM	Pharmacology
FM4.17	Describe and discuss ethical Principles: Respect for autonomy, non-malfeasance, beneficence & justice	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM	Pharmacology
FM4.22	Explain Oath – Hippocrates, Charaka and Sushruta and procedure for administration of Oath	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM	Pharmacology
FM4.23	Describe the modified Declaration of Geneva and its relevance	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM	Pharmacology
FM4.25	Clinical research & Ethics: Discuss human experimentation including clinical trials	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		AETCOM	Pharmacology
FM4.26	Discuss the constitution and functions of ethical committees	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM	Pharmacology
FM4.27	Describe and discuss Ethical Guidelines for Biomedical Research on Human Subjects & Animals	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		AETCOM	Pharmacology
FM8.1	Describe the history of Toxicology	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
FM8.2	Define the terms Toxicology, Forensic Toxicology, Clinical Toxicology and poison	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
FM8.3	Describe the various types of poisons, Toxicokinetics & Toxicodynamics and diagnosis of poisoning in living and dead	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
FM8.4	Describe the Laws in relations to poisons including NDPS Act, Medico-legal aspects of poisons	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
FM8.5	Describe Medico-legal autopsy in cases of poisoning including preservation and dispatch of viscera for chemical analysis	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce/ OSPE		Pharmacology	
FM8.6	Describe the general symptoms, principles of diagnosis and management of common poisons encountered in India	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce /OSCE		Pharmacology	
FM8.7	Describe simple Bedside clinic tests to detect poison/drug in a patient's body fluids	K	K/KH	Y	Lectures, Small group discussion, Bed side clinic, DOAP session	Written/ Viva voce /OSCE		Pharmacology, General Medicine	
FM8.8	Describe basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination	K	K/KH	Y	Lectures, Small group discussion, Bed side clinic, DOAP session	Written/ Viva voce/ OSCE		Pharmacology, General Medicine	
FM9.1	Describe General Principles and basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination with regard to Caustics Inorganic – sulphuric, nitric, and hydrochloric acid Organic- Carboloic Acid (phenol), Oxalic and acetylsalicylic acids.	K	K/KH	Y	Lectures, Small group discussion, Bed side clinic, Autopsy, DOAP session	Written/ Viva voce/ OSCE		Pharmacology, General Medicine	
FM9.2	Describe General Principles and basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination with regard to Phosphorus, Iodine, Barium	K	K/KH	Y	Lectures, Small group discussion, Bed side clinic, Autopsy,DOAP session	Written/ Viva voce/ OSCE		Pharmacology, General Medicine	
FM9.3	Describe General Principles and basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination with regard to Arsenic, lead, mercury, copper, iron, cadmium and thallium	K	K/KH	Y	Lectures, Small group discussion, Bed side clinic, Autopsy, DOAP session	Written/ Viva voce/ OSCE		Pharmacology, General Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
FM9.4	Describe General Principles and basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination with regard to Ethanol, methanol, ethylene glycol	K	K/KH	Y	Lectures, Small group discussion, Bed side clinic, Autopsy, DOAP session	Written/ Viva voce/ OSCE		Pharmacology, General Medicine	
FM9.5	Describe General Principles and basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination with regard to Organophosphates, Carbamates, Organochlorines, Pyrethroids, Paraquat, Aluminium and Zinc phosphide	K	K/KH	Y	Lectures, Small group discussion Bed side clinic, Autopsy, DOAP session	Written/ Viva voce/ OSCE		Pharmacology, General Medicine	Pharmacology
FM9.6	Describe General Principles and basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination with regard to Ammonia, carbon monoxide, hydrogen cyanide & derivatives, methyl isocyanate, tear (riot control) gases	K	K/KH	Y	Lectures, Small group discussion, Bed side clinic, Autopsy, DOAP session	Written/ Viva voce/ OSCE		Pharmacology, General Medicine	
FM10.1	Describe General Principles and basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination with regard to: i. Antipyretics – Paracetamol, Salicylates ii. Anti-Infectives (Common antibiotics – an overview) iii. Neuropsychotoxicology Barbiturates, benzodiazepines, phenytoin, lithium, haloperidol, neuroleptics, tricyclics iv. Narcotic Analgesics, Anaesthetics, and Muscle Relaxants v. Cardiovascular Toxicology Cardiotoxic plants – oleander, odollam, aconite, digitalis vi. Gastro-Intestinal and Endocrinal Drugs – Insulin	K	K/KH	Y	Lectures, Small group discussion, Bed side clinic, Autopsy, DOAP session	Written/ Viva voce/ OSCE		Pharmacology, General Medicine	Pharmacology
	Dermatology, Venereology & Leprosy								
DR5.3	Enumerate and describe the pharmacology, administration and adverse reaction of pharmacotherapies for scabies	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		Pediatrics	Pharmacology
DR7.3	Describe the pharmacology and action of antifungal (systemic and topical). agents Enumerate side effects of antifungal therapy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Microbiology ,Pharmacology

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
DR8.7	Enumerate the indications and describe the pharmacology, administration and adverse reaction of pharmacotherapies for common viral illnesses of the skin	K	KH	Y	Lecture, Small group discussion	Written / Viva voce			Pharmacology
DR9.4	Enumerate, describe and identify lepra reactions and supportive measures and therapy of lepra reactions	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		General Medicine	Pharmacology
DR9.5	Enumerate the indications and describe the pharmacology, administration and adverse reaction of pharmacotherapies for various classes of leprosy based on National Guidelines	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		General Medicine	Pharmacology, Community Medicine
DR9.6	Describe the treatment of Leprosy based on WHO guidelines	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		General Medicine	Pharmacology, Community Medicine
DR9.7	Enumerate and describe the complications of leprosy and its management, including understanding disability and stigma	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		General Medicine	Pharmacology, Psychiatry
DR10.3	Enumerate the indications and describe the pharmacology, administration and adverse reaction of pharmacotherapies for syphilis	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		General Medicine	Pharmacology, Microbiology
DR10.8	Enumerate the indications and describe the pharmacology, indications and adverse reactions of drugs used in the non-syphilitic sexually transmitted diseases (chancroid, donovanosis and LGV)	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		General Medicine	Pharmacology, Microbiology
DR11.3	Enumerate the indications and describe the pharmacology, administration and adverse reaction of pharmacotherapies for dermatologic lesions in HIV	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		General Medicine	Pharmacology, Microbiology
DR14.5	Enumerate the indications and describe the pharmacology indications and adverse reactions of drugs used in the urticaria and angioedema	K	KH	Y	Lecture, Small group discussion	Written / Viva voce			Pharmacology
DR15.3	Enumerate the indications and describe the pharmacology indications and adverse reactions of topical and systemic drugs used in treatment of pyoderma	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		General Surgery	Microbiology, Pharmacology

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
			Anesthesiology						
AS3.6	Choose and write a prescription for appropriate premedications for patients undergoing surgery	S	SH	Y	DOAP session, Bedside clinic session	Skill station		Pharmacology	
AS4.1	Describe and discuss the pharmacology of drugs used in induction and maintenance of general anaesthesia (including intravenous and inhalation induction agents, opiate and non-opiate analgesics, depolarising and non-depolarising muscle relaxants, anticholinesterases	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		Pharmacology	
AS4.3	Observe and describe the principles and the practical aspects of induction and maintenance of anesthesia	S	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce		Pharmacology	
AS5.4	Observe and describe the pharmacology and correct use of commonly used drugs and adjuvant agents in regional anesthesia	S	KH	Y	Lecture, Small group discussion, DOAP session	Written / Viva voce		Pharmacology	
AS8.3	Describe the pharmacology and use of drugs in the management of pain	K	KH	Y	Lecture, Small group discussion, DOAP session	Written / Viva voce		Pharmacology	
AS8.4	Describe the principles of pain management in palliative care	K	KH	Y	Lecture, Small group discussion, DOAP session	Written / Viva voce		Pharmacology	General Medicine
AS8.5	Describe the principles of pain management in the terminally ill	K	KH	Y	Lecture, Small group discussion, DOAP session	Written / Viva voce		Pharmacology	General Medicine
AS10.4	Define and describe common medical and medication errors in anaesthesia	K	KH	Y	Lecture, Small group discussion, DOAP session	Written / Viva voce		Pharmacology	General Medicine
			Psychiatry						

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PS4.4	Describe the treatment of alcohol and substance abuse disorders including behavioural and pharmacologic therapy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	General Medicine
PS4.6	Enumerate and describe the pharmacologic basis and side effects of drugs used in alcohol and substance abuse	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	General Medicine
PS5.3	Describe the treatment of schizophrenia including behavioural and pharmacologic therapy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
PS5.5	Enumerate and describe the pharmacologic basis and side effects of drugs used in schizophrenia	K	KH	Y	Lecture Small group discussion	Written/ Viva voce		Pharmacology	
PS6.4	Describe the treatment of depression including behavioural and pharmacologic therapy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
PS6.6	Enumerate and describe the pharmacologic basis and side effects of drugs used in depression	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
PS7.4	Describe the treatment of bipolar disorders including behavioural and pharmacologic therapy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
PS7.6	Enumerate and describe the pharmacologic basis and side effects of drugs used in bipolar disorders	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
PS8.4	Describe the treatment of anxiety disorders including behavioural and pharmacologic therapy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
PS8.6	Enumerate and describe the pharmacologic basis and side effects of drugs used in anxiety disorders	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
PS10.4	Describe the treatment of somatoform disorders including behavioural, psychosocial and pharmacologic therapy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	General Medicine
PS10.6	Enumerate and describe the pharmacologic basis and side effects of drugs used in somatoform, dissociative and conversion disorders	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	General Medicine

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PS11.4	Describe the treatment of **personality** disorders including behavioural, psychosocial and pharmacologic therapy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
PS11.6	Enumerate and describe the pharmacologic basis and side effects of drugs used in personality disorders	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
PS12.4	Describe the treatment of **psychosomatic** disorders including behavioural, psychosocial and pharmacologic therapy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	General Medicine
PS12.6	Enumerate and describe the pharmacologic basis and side effects of drugs used in psychosomatic disorders	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
PS13.4	Describe the treatment of psychosexual and gender identity disorders including behavioural, psychosocial and pharmacologic therapy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
PS18.1	Enumerate the indications and describe the pharmacology, dose and side effects of commonly use drugs in psychiatric disorders	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
				General Medicine					
IM1.24	Describe and discuss the pharmacology of drugs including indications & contraindications in the management of heart failure including diuretics, ACE inhibitors, Beta blockers, aldosterone antagonists and cardiac glycosides	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
IM1.27	Describe and discuss the role of penicillin prophylaxis in the prevention of rheumatic heart disease	K	KH	Y	Bedside clinic, Small group discussion	Written		Microbiology Pharmacology	
IM1.30	Administer an intramuscular injection with an appropriate explanation to the patient	S	SH	Y	Bedside clinic, Skill assessment	log book documentation of completion		Pharmacology	
IM2.15	Discuss and describe the medications used in patients with an acute coronary syndrome based on the clinical presentation	K	KH	Y	Lecture Small group discussion	Written/ Viva voce		Pharmacology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
IM2.18	Discuss and describe the indications, formulations, doses, side effects and monitoring for drugs used in the management of dyslipidemia	K	KH	Y	Lecture Small group discussion	Written/ Viva voce		Pharmacology, Biochemistry	
IM2.20	Discuss and describe the assessment and relief of pain in acute coronary syndromes	K	KH	Y	Lecture Small group discussion	Written/ Viva voce		Pharmacology	
IM2.23	Describe and discuss the indications for nitrates, anti platelet agents, gpIIb - IIIa inhibitors, beta blockers, ACE inhibitors etc in the management of coronary syndromes	K	KH	Y	Lecture Small group discussion	Written/ Viva voce		Pharmacology	
IM3.12	Select, describe and prescribe based on the most likely aetiology, an appropriate empirical antimicrobial based on the pharmacology and antimicrobial spectrum	S	SH	Y	Bed side clinic, DOAP session	Skill Assessment/ Written/ Viva voce		Pharmacology, Microbiology	
IM3.13	Select, describe and prescribe based on culture and sensitivity appropriate empaling antimicrobial based on the pharmacology and antimicrobial spectrum	S	SH	Y	Bed side clinic, DOAP session	Skill Assessment/ Written/ Viva voce		Pharmacology, Microbiology	
IM4.22	Describe and discuss the pharmacology, indications, adverse reactions, interactions of antimalarial drugs and basis of resistance	K	KH	Y	Small group, Lecture	Written/ Viva voce		Pharmacology	
IM4.23	Prescribe drugs for malaria based on the species identified, prevalence of drug resistance and National Programs	S	SH	Y	Skill assessment	Skill assessment		Microbiology, Pharmacology	
IM4.26	Counsel the patient on malarial prevention	C	SH	Y	DOAP session	Skill assessment		Microbiology, Pharmacology	
IM5.7	Enumerate and describe the causes and pathophysiology of drug induced liver injury	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Pharmacology	
IM5.16	Describe and discuss the management of hepatitis, cirrhosis, portal hypertension, ascites spontaneous, bacterial peritonitis and hepatic encephalopathy	K	KH	Y	Written, Small group	Skill Assessment/ Written/ Viva voce		Pharmacology	General Surgery
IM6.13	Describe and enumerate the indications and side effects of drugs for bacterial, viral and other types of diarrhea	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology, Microbiology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
IM6.17	Discuss and describe the principles of HAART, the classes of antiretrovirals used, adverse reactions and interactions	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology, Pharmacology	
IM6.18	Discuss and describe the principles and regimens used in post exposure prophylaxis	K	K	Y	Lecture Small group discussion	Written/ Viva voce		Microbiology, Pharmacology	
IM7.21	Select, prescribe and communicate appropriate medications for relief of joint pain	K/C	SH	Y	DOAP session	Skill assessment/ written		Pharmacology	Orthopedics
IM7.22	Select, prescribe and communicate preventive therapy for crystalline arthropathies	K/C	SH	Y	DOAP session	Skill assessment/ written		Pharmacology	
IM7.23	Select, prescribe and communicate treatment option for systemic rheumatologic conditions	K/C	SH	Y	DOAP session	Skill assessment/ written		Pharmacology	
IM7.24	Describe the basis for biologic and disease modifying therapy in rheumatologic diseases	K	KH	Y	Bed side clinic, Small group discussion	Skill assessment/ written		Pharmacology	
IM8.14	Develop an appropriate treatment plan for essential hypertension	K	KH	Y	Small group discussion	Skill assessment/ Written/ Viva voce		Pharmacology	
IM8.15	Recognise, prioritise and manage hypertensive emergencies	S	SH	Y	DOAP session	Skill assessment/ written		Pharmacology	
IM9.14	Prescribe replacement therapy with iron, B12, folate	S	SH	Y	Bed side clinic, DOAP session	Skill assessment/ written		Pharmacology	
IM9.15	Describe the national programs for anemia prevention	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology, Community Medicine	
IM10.25	Identify and describe the priorities in the management of ARF including diet, volume management, alteration in doses of drugs, monitoring and indications for dialysis	K/C	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
IM11.16	Discuss and describe the pharmacologic therapies for diabetes their indications, contraindications, adverse reactions and interactions	K	KH	Y	Small group discussion, Lecture	Written/ Viva voce		Pharmacology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
IM11.18	Describe and discuss the pharmacology, indications, adverse reactions and interactions of drugs used in the prevention and treatment of target organ damage and complications of Type II Diabetes including neuropathy, nephropathy, retinopathy, hypertension, dyslipidemia and cardiovascular disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
IM11.19	Demonstrate and counsel patients on the correct technique to administer insulin	S/C	SH	Y	DOAP session	Skill assessment		Pharmacology	
IM12.13	Describe the pharmacology, indications, adverse reaction, interactions of thyroxine and antithyroid drugs	K	KH	Y	Lecture, Small group discussion	Viva voce/ short note		Pharmacology	General Surgery
IM12.14	Write and communicate to the patient appropriately a prescription for thyroxine based on age, sex, and clinical and biochemical status	S/C	SH	Y	Skill assessment	Skill assessment		Pharmacology	
IM12.15	Describe and discuss the indications of thionamide therapy, radio iodine therapy and General Surgery in the management of thyrotoxicosis	K	KH	Y	Bedside clinic, small group discussion	short note/ Viva voce		Pharmacology	General Surgery
IM13.6	Describe and distinguish the difference between curative and palliative care in patients with cancer	K	K	N	Lecture, Small group discussion	short note/ Viva voce		Pharmacology	
IM13.13	Describe and assess pain and suffering objectively in a patient with cancer	K	KH	Y	Bedside clinic, small group discussion	short note/ Viva voce		Pharmacology	General Surgery
IM13.14	Describe the indications for General Surgery, radiation and chemotherapy for common malignancies	K	KH	Y	Bedside clinic, small group discussion	short note/ Viva voce		Pharmacology	General Surgery
IM13.17	Describe and enumerate the indications, use, side effects of narcotics in pain alleviation in patients with cancer	K	KH	Y	Bedside clinic, small group discussion	short note/ Viva voce		Pharmacology	Anesthesiology
IM14.13	Describe and enumerate the indications, pharmacology and side effects of pharmacotherapy for obesity	K	K	Y	Lecture, small group discussion	short note/ Viva voce		Pharmacology	
IM15.14	Describe and enumerate the indications, pharmacology and side effects of pharmacotherapy of pressors used in the treatment of Upper GI bleed	K	K	Y	Lecture, Small group discussion	Viva voce/ short note		Pharmacology	General Surgery

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
IM15.15	Describe and enumerate the indications, pharmacology and side effects of pharmacotherapy of acid peptic disease including Helicobacter pylori	K	K	Y	Lecture, small group discussion	short note/ Viva voce		Pharmacology, Microbiology	General Surgery
IM16.13	Describe and enumerate the indications, pharmacology and side effects of pharmacotherapy for parasitic causes of diarrhea	K	K	Y	Lecture, small group discussion	short note/ Viva voce		Pharmacology, Microbiology	
IM16.14	Describe and enumerate the indications, pharmacology and side effects of pharmacotherapy for bacterial and viral diarrhea	K	K	Y	Lecture, Small group discussion	Short note/ Viva voce		Pharmacology, Microbiology	
IM16.16	Describe and enumerate the indications, pharmacology and side effects of pharmacotherapy including immunotherapy	K	K	Y	Lecture, small group discussion	short note/ Viva voce		Pharmacology	
IM17.11	Describe the indications, pharmacology, dose, side effects of abortive therapy in migraine	K	KH	Y	Lecture, Small Group discussion	Written/ Viva voce		Pharmacology	
IM17.12	Describe the indications, pharmacology, dose, side effects of prophylactic therapy in migraine	K	KH	Y	Lecture, Small Group discussion	Written/ Viva voce		Pharmacology	
IM17.13	Describe the pharmacology, dose, adverse reactions and regimens of drugs used in the treatment of bacterial, tubercular and viral meningitis	K	KH	Y	Lecture, Small Group discussion	Written/ Viva voce		Pharmacology	
IM17.14	Counsel patients with migraine on lifestyle changes and need for prophylactic therapy	A/C	SH	N	DOAP session	Skill Assessment		Pharmacology	
IM19.8	Discuss and describe the pharmacology, dose, side effects and interactions used in the drug therapy of Parkinson’s syndrome	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
IM19.9	Enumerate the indications for use of surgery and botulinum toxin in the treatment of movement disorders	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	General Surgery
IM20.1	Enumerate the poisonous snakes of your area and describe the distinguishing marks of each	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Forensic Medicine, Pharmacology	
IM20.7	Enumerate the indications and describe the pharmacology, dose, adverse reactions, hypersensitivity reactions of anti-snake venom	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
IM20.8	Describe the diagnosis, initial approach, stabilisation and therapy of scorpion envenomation	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
IM20.9	Describe the diagnosis, initial approach, stabilisation and therapy of bee sting allergy	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
IM21.1	Describe the initial approach to the stabilisation of the patient who presents with poisoning	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
IM21.2	Enumerate the common plant poisons seen in your area and describe their toxicology, clinical features, prognosis and specific approach to detoxification	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Forensic Medicine, Pharmacology	
IM21.3	Enumerate the common corrosives used in your area and describe their toxicology, clinical features, prognosis and approach to therapy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Forensic Medicine, Pharmacology	
IM21.4	Enumerate the commonly observed drug overdose in your area and describe their toxicology, clinical features, prognosis and approach to therapy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Forensic Medicine, Pharmacology	
IM21.5	Observe and describe the functions and role of a poison center in suspected poisoning	S	KH	Y	DOAP session	document in log book		Forensic Medicine, Pharmacology	
IM21.6	Describe the medico-legal aspects of suspected suicidal or homicidal poisoning and demonstrate the correct procedure to write a medico-legal report on a suspected poisoning	S	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce/ Skill assessment		Forensic Medicine, Pharmacology	
IM21.7	Counsel family members of a patient with suspected poisoning about the clinical and medico-legal aspects with empathy	A/C	SH	Y	DOAP session	Skill assessment		Forensic Medicine, Pharmacology	
IM22.3	Describe the approach to the management of hypercalcemia	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
IM25.11	Develop an appropriate empiric treatment plan based on the patient's clinical and immune status pending definitive diagnosis	C	SH	Y	DOAP session	Skill assessment		Microbiology, Pharmacology	

Pediatrics

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PE13.5	Propose a management plan for Fe Deficiency Anaemia	S	SH	Y	Bed side clinics, Skill lab	Skill Assessment		Pathology, Pharmacology	
PE13.6	Discuss the National Anaemia Control Program and its recommendations	K	K	Y	Lecture, Small group Discussion	Written/ Viva voce		Pharmacology, Community Medicine	
PE14.1	Discuss the risk factors, clinical features, diagnosis and management of Lead Poisoning	K	KH	N	Lecture, Small group Discussion	Written/ Viva voce		Pharmacology	
PE14.3	Discuss the risk factors, clinical features, diagnosis and management of Organo phosphorous poisoning	K	KH	N	Lecture, Small group Discussion	Written/ Viva voce		Pharmacology	General Medicine
PE14.4	Discuss the risk factors, clinical features, diagnosis and management of paracetamol Poisoning	K	KH	N	Lecture, Small group Discussion	Written/ Viva voce		Pharmacology	
PE24.5	Discuss the role of antibiotics, antispasmodics, anti-secretory drugs, probiotics, anti- emetics in acute diarrheal diseases	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology, Microbiology	
PE24.8	Discuss the causes, clinical presentation and management of dysentery in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology, Microbiology	
PE34.3	Discuss the various regimens for management of Tuberculosis as per National Guidelines	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology, Community Medicine, Pharmacology	Respiratory Medicine
PE34.4	Discuss the preventive strategies adopted and the objectives and outcome of the National Tuberculosis Control Program	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology, Community Medicine, Pharmacology	Respiratory Medicine
	General Surgery								
SU13.2	Discuss the Principles of immunosuppressive therapy. Enumerate indications, describe surgical principles, management of organ transplantation	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology, Pharmacology	
	Physical Medicine & Rehabilitation								

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PM3.5	Enumerate the indications and describe the therapies for spasticity including medications, serial casts, nerve blocks, botulinum toxin injections	K	KH	Y	Lectures, Small group discussion			Pharmacology	Pediatrics, Orthopedics
PM7.6	Enumerate the indications and describe the pharmacology and side effects of commonly used drugs in neuropathic bladder	K	KH	Y	Lectures, Small group discussion	Written / Viva voce		Pharmacology	General Medicine
Respiratory Medicine									
CT1.4	Describe the epidemiology, the predisposing factors and microbial and therapeutic factors that determine resistance to drugs	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine, Microbiology, Pharmacology	
CT1.14	Describe and discuss the pharmacology of various antituberculous agents, their indications, contraindications, interactions and adverse reactions	K	KH	Y	Lecture, Small group discussion	short note/ Viva voce		Pharmacology, Microbiology	
CT1.15	Prescribe an appropriate antituberculosis regimen based on the location of disease, smear positivity and negativity and co-morbidities based on current national guidelines including directly observed tuberculosis therapy (DOTS)	K	SH	Y	Bedside clinic, Small group discussion, Lecture	Skill assessment		Pharmacology, Community Medicine	
CT2.16	Discuss and describe therapies for OAD including bronchodilators, leukotriene inhibitors, mast cell stabilisers, theophylline, inhaled and systemic steroids, oxygen and immunotherapy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
Orthopaedics									

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
OR3.1	Describe and discuss the aetiopathogenesis, clinical features, Investigations and principles of management of Bone and Joint infections a) Acute Osteomyelitis b) Subacute osteomyelitis c) Acute Suppurative arthritis d) Septic arthritis & HIV infection e) Spirochaetal infection f) Skeletal Tuberculosis	K/S	K/KH/SH	Y	Lecture, Small group Discussion,Video assisted lecture	Written/ Viva voce/ OSCE	_	Pathology, Microbiology	General surgery

PATHOLOGY (CODE: PA)

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
PATHOLOGY									
Topic: Introduction to Pathology		**Number of competencies: (03)**				**Number of procedures that require certification: (NIL)**			
PA1.1	Describe the role of a pathologist in diagnosis and management of disease	K	K	Y	Departmental orientation	Written/ Viva voce			
PA1.2	Enumerate common definitions and terms used in Pathology	K	K	Y	Lecture, Small group discussion	Written/ Viva voce			
PA1.3	Describe the history and evolution of Pathology	K	K	N	Lecture, Small group discussion	Written/ Viva voce			
Topic: Cell Injury and Adaptation		**Number of competencies: (08)**				**Number of procedures that require certification: (NIL)**			
PA2.1	Demonstrate knowledge of the causes, mechanisms, types and effects of cell injury and their clinical significance	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PA2.2	Describe the etiology of cell injury. Distinguish between reversible-irreversible injury: mechanisms; morphology of cell injury	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PA2.3	Intracellular accumulation of fats, proteins, carbohydrates, pigments	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PA2.4	Describe and discuss Cell death- types, mechanisms, necrosis, apoptosis (basic as contrasted with necrosis), autolysis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PA2.5	Describe and discuss pathologic calcifications, gangrene	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PA2.6	Describe and discuss cellular adaptations: atrophy, hypertrophy, hyperplasia, metaplasia, dysplasia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
PA2.7	Describe and discuss the mechanisms of cellular aging and apoptosis	K	KH	N	Lecture, Small group discussion	Written/ Viva voce			
PA2.8	Identify and describe various forms of cell injuries, their manifestations and consequences in gross and microscopic specimens	S	SH	Y	DOAP session	Skill assessment			
Topic: Amyloidosis		**Number of competencies: (02)**				**Number of procedures that require certification: (NIL)**			
PA3.1	Describe the pathogenesis and pathology of amyloidosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PA3.2	Identify and describe amyloidosis in a pathology specimen	S	SH	N	DOAP session	Skill assessment			
Topic: Inflammation		**Number of competencies:(04)**				**Number of procedures that require certification: (NIL)**			
PA4.1	Define and describe the general features of acute and chronic inflammation including stimuli, vascular and cellular events	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
PA4.2	Enumerate and describe the mediators of acute inflammation	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
PA4.3	Define and describe chronic inflammation including causes, types, non-specific and granulomatous; and enumerate examples of each	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PA4.4	Identify and describe acute and chronic inflammation in gross and microscopic specimens	S	SH	Y	DOAP session	Skill assessment			
Topic: Healing and repair		**Number of competencies: (01)**				**Number of procedures that require certification:(NIL)**			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
PA5.1	Define and describe the process of repair and regeneration including wound healing and its types	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
Topic: Hemodynamic disorders		**Number of competencies: (07)**				**Number of procedures that require certification :(NIL)**			
PA6.1	Define and describe edema, its types, pathogenesis and clinical correlations	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA6.2	Define and describe hyperemia, congestion, hemorrhage	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PA6.3	Define and describe shock, its pathogenesis and its stages	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
PA6.4	Define and describe normal haemostasis and the etiopathogenesis and consequences of thrombosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PA6.5	Define and describe embolism and its causes and common types	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PA6.6	Define and describe Ischaemia/infarction its types, etiology, morphologic changes and clinical effects	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PA6.7	Identify and describe the gross and microscopic features of infarction in a pathologic specimen	S	SH	Y	DOAP session	Skill Assessment			
Topic: Neoplastic disorders		**Number of competencies: (05)**				**Number of procedures that require certification: (NIL)**			
PA7.1	Define and classify neoplasia. Describe the characteristics of neoplasia including gross, microscopy, biologic, behaviour and spread. Differentiate between benign from maignant neoplams	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PA7.2	Describe the molecular basis of cancer	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
PA7.3	Enumerate carcinogens and describe the process of carcinogenesis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PA7.4	Describe the effects of tumor on the host including paraneoplastic syndrome	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PA7.5	Describe immunology and the immune response to cancer	K	KH	N	Lecture, Small group discussion	Written/ Viva voce			Microbiology
	Topic: Basic diagnostic cytology		**Number of competencies:(03)**			**Number of procedures that require certification:(NIL)**			
PA8.1	Describe the diagnostic role of cytology and its application in clinical care	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
PA8.2	Describe the basis of exfoliative cytology including the technique & stains used	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce/ Skill assessment		General Surgery	
PA8.3	Observe a diagnostic cytology and its staining and interpret the specimen	S	KH	Y	DOAP session	Skill assessment			
Topic: Immunopathology and AIDS			**Number of competencies: (07)**			**Number of procedures that require certification: (NIL)**			
PA9.1	Describe the principles and mechanisms involved in immunity	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	Microbiology
PA9.2	Describe the mechanism of hypersensitivity reactions	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Microbiology
PA9.3	Describe the HLA system and the immune principles involved in transplant and mechanism of transplant rejection	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Microbiology
PA9.4	Define autoimmunity. Enumerate autoimmune disorders	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA9.5	Define and describe the pathogenesis of systemic Lupus Erythematosus	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
PA9.6	Define and describe the pathogenesis and pathology of HIV and AIDS	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
PA9.7	Define and describe the pathogenesis of other common autoimmune diseases	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
Topic: Infections and Infestations		**Number of competencies: (04)**			**Number of procedures that require certification:(NIL)**				
PA10.1	Define and describe the pathogenesis and pathology of malaria	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
PA10.2	Define and describe the pathogenesis and pathology of cysticercosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
PA10.3	Define and describe the pathogenesis and pathology of leprosy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
PA10.4	Define and describe the pathogenesis and pathology of common bacterial, viral, protozoal and helminthic diseases	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
Topic: Genetic and paediatric diseases		**Number of competencies: (03)**			**Number of procedures that require certification :(NIL)**				
PA11.1	Describe the pathogenesis and features of common cytogenetic abnormalities and mutations in childhood	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	
PA11.2	Describe the pathogenesis and pathology of tumor and tumour-like conditions in infancy and childhood	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	
PA11.3	Describe the pathogenesis of common storage disorders in infancy and childhood	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	
Topic: Environmental and nutritional diseases		**Number of competencies:(03)**			**Number of procedures that require certification:(NIL)**				

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
PA12.1	Enumerate and describe the pathogenesis of disorders caused by air pollution, tobacco and alcohol	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Community Medicine
PA12.2	Describe the pathogenesis of disorders caused by protein calorie malnutrition and starvation	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, Pediatrics	
PA12.3	Describe the pathogenesis of obesity and its consequences	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
Topic: Introduction to haematology		**Number of competencies: (05)**			**Number of procedures that require certification:(NIL)**				
PA13.1	Describe hematopoiesis and extramedullary hematopoiesis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA13.2	Describe the role of anticoagulants in hematology	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA13.3	Define and classify anemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA13.4	Enumerate and describe the investigation of anemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA13.5	Perform, Identify and describe the peripheral blood picture in anemia	S	SH	Y	DOAP session	Skill assessment		General Medicine	
Topic: Microcytic anemia		**Number of competencies: (03)**			**Number of procedures that require certification:(NIL)**				
PA14.1	Describe iron metabolism	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PA14.2	Describe the etiology, investigations and differential diagnosis of microcytic hypochromic anemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA14.3	Identify and describe the peripheral smear in microcytic anemia	S	SH	Y	DOAP session	Skill assessment		General Medicine	
Topic: Macrocytic anemia		**Number of competencies: (04)**			**Number of procedures that require certification:(NIL)**				

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
PA15.1	Describe the metabolism of Vitamin B12 and the etiology and pathogenesis of B12 deficiency	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, General Medicine	
PA15.2	Describe laboratory investigations of macrocytic anemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA15.3	Identify and describe the peripheral blood picture of macrocytic anemia	S	SH	Y	DOAP session	Skill assessment			
PA15.4	Enumerate the differences and describe the etiology and distinguishing features of megaloblastic and non-megaloblastic macrocytic anemia	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
Topic: Hemolytic anemia		**Number of competencies: (07)**				**Number of procedures that require certification: (01)**			
PA16.1	Define and classify hemolytic anemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, General Medicine	
PA16.2	Describe the pathogenesis and clinical features and hematologic indices of hemolytic anemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, General Medicine	
PA16.3	Describe the pathogenesis, features, hematologic indices and peripheral blood picture of sickle cell anemia and thalassemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, General Medicine	
PA16.4	Describe the etiology pathogenesis, hematologic indices and peripheral blood picture of Acquired hemolytic anemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, General Medicine	
PA16.5	Describe the peripheral blood picture in different hemolytic anaemias	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA16.6	Prepare a peripheral blood smear and identify hemolytic anaemia from it	S	P	Y	DOAP session	Skill assessment	1		
PA16.7	Discribe the correct technique to perform a cross match	S	SH	Y	Lecture, Small group discussion	Written/ Viva voce			
Topic: Aplastic anemia		**Number of competencies: (02)**				**Number of procedures that require certification:(NIL)**			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
PA 17.1	Enumerate the etiology, pathogenesis and findings in aplastic anemia	K	K	N	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA17.2	Enumerate the indications and describe the findings in bone marrow aspiration and biopsy	K	K	N	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
Topic: Leukocyte disorders		**Number of competencies: (02)**			**Number of procedures that require certification:(NIL)**				
PA18.1	Enumerate and describe the causes of leucocytosis leucopenia lymphocytosis and leukemoid reactions	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PA`18.2	Describe the etiology, genetics, pathogenesis classification, features, hematologic features of acute and chronic leukemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
Topic: Lymph node and spleen		**Number of competencies: (07)**			**Number of procedures that require certification:(NIL)**				
PA19.1	Enumerate the causes and describe the differentiating features of lymphadenopathy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
PA19.2	Describe the pathogenesis and pathology of tuberculous lymphadenitis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
PA19.3	Identify and describe the features of tuberculous lymphadenitis in a gross and microscopic specimen	S	SH	Y	DOAP session	Skill assessment			
PA19.4	Describe and discuss the pathogenesis, pathology and the differentiating features of Hodgkin's and non-Hodgkin's lymphoma	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
PA19.5	Identify and describe the features of Hodgkin's lymphoma in a gross and microscopic specimen	S	SH	Y	DOAP session	Skill assessment		General Surgery	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
PA19.6	Enumerate and differentiate the causes of splenomegaly	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery, General Medicine	
PA19.7	Identify and describe the gross specimen of an enlarged spleen	S	SH	Y	DOAP session	Skill assessment			
Topic: Plasma cell disorders		**Number of competencies: (01)**				**Number of procedures that require certification: (NIL)**			
PA20.1	Describe the features of plasma cell myeloma	S	SH	Y	DOAP session	Skill assessment			
Topic: Hemorrhagic disorders		**Number of competencies: (05)**				**Number of procedures that require certification:(NIL)**			
PA21.1	Describe normal hemostasis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PA21.2	Classify and describe the etiology, pathogenesis and pathology of vascular and platelet disorders including ITP and haemophilia's	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	
PA21.3	Differentiate platelet from clotting disorders based on the clinical and hematologic features	S	SH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA21.4	Define and describe disseminated intravascular coagulation, its laboratory findings and diagnosis of disseminated intravascular coagulation	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA21.5	Define and describe disseminated intravascular coagulation, its laboratory findings and diagnosis of Vitamin K deficiency	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
Topic: Blood banking and transfusion		**Number of competencies: (07)**				**Number of procedures that require certification: (NIL)**			
PA22.1	Classify and describe blood group systems (ABO and RH)	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PA22.2	Enumerate the indications, describe the principles, enumerate and demonstrate the steps of compatibility testing	S	SH	Y	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
PA22.4	Enumerate blood components and describe their clinical uses	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery, General Medicine	
PA22.5	Enumerate and describe infections transmitted by blood transfusion	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Microbiology
PA22.6	Describe transfusion reactions and enumerate the steps in the investigation of a transfusion reaction	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA22.7	Enumerate the indications and describe the principles and procedure of autologous transfusion	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
Topic:Clinical Pathology		**Number of competencies: (03)**				**Number of procedures that require certification: (NIL)**			
PA23.1	Describe abnormal urinary findings in disease states and identify and describe common urinary abnormalities in a clinical specimen	S	SH	Y	DOAP session	Skill Assessment			
PA23.2	Describe abnormal findings in body fluids in various disease states	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PA23.3	Describe and interpret the abnormalities in a panel containing semen analysis, thyroid function tests, renal function tests or liver function tests	S	SH	Y	DOAP session	Skill Assessment			
Topic: Gastrointestinal tract		**Number of competencies: (07)**				**Number of procedures that require certification: (NIL)**			
PA24.1	Describe the etiology, pathogenesis, pathology and clinical features of oral cancers	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Dentistry	
PA24.2	Describe the etiology, pathogenesis, pathology, microbiology, clinical and microscopic features of peptic ulcer disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA24.3	Describe and identify the microscopic features of peptic ulcer	S	SH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
PA24.4	Describe and etiology and pathogenesis and pathologic features of carcinoma of the stomach	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
PA24.5	Describe and etiology and pathogenesis and pathologic features of Tuberculosis of the intestine	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
PA24.6	Describe and etiology and pathogenesis and pathologic and distinguishing features of Inflammatory bowel disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
PA24.7	Describe the etiology, pathogenesis, pathology and distinguishing features of carcinoma of the colon	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
Topic: Hepatobiliary system		**Number of competencies: (06)**				**Number of procedures that require certification: (01)**			
PA25.1	Describe bilirubin metabolism, enumerate the etiology and pathogenesis of jaundice, distinguish between direct and indirect hyperbilirubinemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, General Medicine	
PA25.2	Describe the pathophysiology and pathologic changes seen in hepatic failure and their clincial manifestations, complications and consequences	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, General Surgery	
PA25.3	Describe the etiology and pathogenesis of viral and toxic hepatitis: distinguish the causes of hepatitis based on the clinical and laboratory features. Describe the pathology, complications and consequences of hepatitis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA25.4	Describe the pathophysiology, pathology and progression of alcoholic liver disease including cirrhosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, General Surgery	
PA25.5	Describe the etiology, pathogenesis and complications of portal hypertension	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, General Surgery	
PA25.6	Interpret liver function and viral hepatitis serology panel. Distinguish obstructive from non-obstructive jaundice based on clinical features and liver function tests	S	P	Y	DOAP session	Skill assessment	1	General Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
Topic: Respiratory system		**Number of competencies: (07)**				**Number of procedures that require certification: (NIL)**			
PA26.1	Define and describe the etiology, types, pathogenesis, stages, morphology and complications of pneumonia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
PA26.2	Describe the etiology, gross and microscopic appearance and complications of lung abscess	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
PA26.3	Define and describe the etiology, types, pathogenesis, stages, morphology and complications and evaluation of Obstructive airway disease (OAD) and bronchiectasis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, General Medicine	Microbiology
PA26.4	Define and describe the etiology, types, pathogenesis, stages, morphology microscopic appearance and complications of tuberculosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
PA26.5	Define and describe the etiology, types, exposure, environmental influence, pathogenesis, stages, morphology, microscopic appearance and complications of Occupational lung disease	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		General Medicine, Community Medicine	
PA26.6	Define and describe the etiology, types, exposure, genetics environmental influence, pathogenesis, stages, morphology, microscopic appearance,metastases and complications of tumors of the lung and pleura	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA26.7	Define and describe the etiology, types, exposure, genetics environmental influence, pathogenesis, morphology, microscopic appearance and complications of mesothelioma	K	KH	N	Lecture, Small group discussion	Written / Viva voce		General Medicine, Community Medicine	
Topic: Cardiovascular system		**Number of competencies: (10)**				**Number of procedures that require certification: (NIL)**			
PA27.1	Distinguish arteriosclerosis from atherosclerosis. Describe the pathogenesis and pathology of various causes and types of arteriosclerosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA27.2	Describe the etiology, dynamics, pathology types and complications of aneurysms including aortic aneurysms	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
PA27.3	Describe the etiology, types, stages pathophysiology, pathology and complications of heart failure	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Physiology	
PA27.4	Describe the etiology, pathophysiology, pathology, gross and microscopic features, criteria and complications of rheumatic fever	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
PA27.5	Describe the epidemiology, risk factors, etiology, pathophysiology, pathology, presentations, gross and microscopic features, diagnostic tests and complications of ischemic heart disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA27.6	Describe the etiology, pathophysiology, pathology, gross and microscopic features, diagnosis and complications of infective endocarditis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
PA27.7	Describe the etiology, pathophysiology, pathology, gross and microscopic features, diagnosis and complications of pericarditis and pericardial effusion	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA27.8	Interpret abnormalities in cardiac function testing in acute coronary syndromes	S	SH	Y	DOAP session	Skill Assessment		Physiology, General Medicine	
PA27.9	Classify and describe the etiology, types, pathophysiology, pathology, gross and microscopic features, diagnosis and complications of cardiomyopathies	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Physiology	
PA27.10	Describe the etiology, pathophysiology, pathology features and complications of syphilis on the cardiovascular system	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
Topic: Urinary Tract		**Number of competencies: (16)**				**Number of procedures that require certification: (NIL)**			
PA28.1	Describe the normal histology of the kidney	K	K	Y	Lecture, Small group discussion	Written/ Viva voce			
PA28.2	Define, classify and distinguish the clinical syndromes and describe the etiology, pathogenesis, pathology, morphology, clinical and laboratory and urinary findings, complications of renal failure	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
PA28.3	Define and describe the etiology, precipitating factors, pathogenesis, pathology, laboratory urinary findings, progression and complications of acute renal failure	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA28.4	Define and describe the etiology, precipitating factors, pathogenesis, pathology, laboratory urinary findings progression and complications of chronic renal failure	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA28.5	Define and classify glomerular diseases. Enumerate and describe the etiology, pathogenesis, mechanisms of glomerular injury, pathology, distinguishing features and clinical manifestations of glomerulonephritis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, General Medicine	
PA28.6	Define and describe the etiology, pathogenesis, pathology, laboratory, urinary findings, progression and complications of IgA nephropathy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA28.7	Enumerate and describe the findings in glomerular manifestations of systemic disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA28.8	Enumerate and classify diseases affecting the tubular interstitium	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA28.9	Define and describe the etiology, pathogenesis, pathology, laboratory, urinary findings, progression and complications of acute tubular necrosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA28.10	Describe the etiology, pathogenesis, pathology, laboratory findings, distinguishing features progression and complications of acute and chronic pyelonephritis and reflux nephropathy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy, General Surgery	
PA28.11	Define classify and describe the etiology, pathogenesis pathology, laboratory, urinary findings, distinguishing features progression and complications of vascular disease of the kidney	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
PA28.12	Define classify and describe the genetics, inheritance, etiology, pathogenesis, pathology, laboratory, urinary findings, distinguishing features, progression and complications of cystic disease of the kidney	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Pediatrics	
PA28.13	Define classify and describe the etiology, pathogenesis, pathology, laboratory, urinary findings, distinguishing features progression and complications of renal stone disease and obstructive uropathy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
PA28.14	Classify and describe the etiology, genetics, pathogenesis, pathology, presenting features, progression and spread of renal tumors	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	
PA28.15	Describe the etiology, genetics, pathogenesis, pathology, presenting features and progression of thrombotic angiopathies	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA28.16	Describe the etiology, genetics, pathogenesis, pathology, presenting features and progression of urothelial tumors	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
Topic: Male Genital Tract		**Number of competencies: (05)**			**Number of procedures that require certification: (NIL)**				
PA29.1	Classify testicular tumors and describe the pathogenesis, pathology, presenting and distinguishing features, diagnostic tests, progression and spread of testicular tumors	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
PA29.2	Describe the pathogenesis, pathology, presenting and distinguishing features, diagnostic tests, progression and spread of carcinoma of the penis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
PA29.3	Describe the pathogenesis, pathology, hormonal dependency presenting and distinguishing features, urologic findings & diagnostic tests of benign prostatic hyperplasia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
PA29.4	Describe the pathogenesis, pathology, hormonal dependency presenting and distinguishing features, diagnostic tests, progression and spread of carcinoma of the prostate	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
PA29.5	Describe the etiology, pathogenesis, pathology and progression of prostatitis	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
Topic: Female Genital Tract		**Number of competencies: (09)**			**Number of procedures that require certification: (NIL)**				
PA30.1	Describe the epidemiology, pathogenesis, etiology, pathology, screening, diagnosis and progression of carcinoma of the cervix	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology	
PA30.2	Describe the pathogenesis, etiology, pathology, diagnosis and progression and spread of carcinoma of the endometrium	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology	
PA30.3	Describe the pathogenesis, etiology, pathology, diagnosis and progression and spread of carcinoma of the leiomyomas and leiomyosarcomas	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology	
PA30.4	Classify and describe the etiology, pathogenesis, pathology, morphology, clinical course, spread and complications of ovarian tumors	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology	
PA30.5	Describe the etiology, pathogenesis, pathology, morphology, clinical course, spread and complications of gestational trophoblastic neoplasms	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology	
PA30.6	Describe the etiology and morphologic features of cervicitis	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology	
PA30.7	Describe the etiology, hormonal dependence, features and morphology of endometriosis	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology	
PA30.8	Describe the etiology and morphologic features of adenomyosis	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
PA30.9	Describe the etiology, hormonal dependence and morphology of endometrial hyperplasia	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology	
Topic: Breast		**Number of competencies: (04)**			**Number of procedures that require certification: (NIL)**				
PA31.1	Classify and describe the types, etiology, pathogenesis, pathology and hormonal dependency of benign breast disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy, General Surgery	
PA31.2	Classify and describe the epidemiology, pathogenesis, classification, morphology, prognostic factors, hormonal dependency, staging and spread of carcinoma of the breast	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
PA31.3	Describe and identify the morphologic and microscopic features of carcinoma of the breast	S	SH	N	DOAP session	Skill Assessment		General Surgery	
PA31.4	Enumerate and describe the etiology, hormonal dependency and pathogenesis of gynecomastia	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Pediatrics, General Medicine	
Topic: Endocrine system		**Number of competencies: (09)**			**Number of procedures that require certification: (NIL)**				
PA32.1	Enumerate, classify and describe the etiology, pathogenesis, pathology and iodine dependency of thyroid swellings	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy, Physiology, General Medicine, General Surgery	
PA32.2	Describe the etiology, cause, iodine dependency, pathogenesis, manifestations, laboratory and imaging features and course of thyrotoxicosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, General Medicine	
PA32.3	Describe the etiology, pathogenesis, manifestations, laboratory and imaging features and course of thyrotoxicosis/ hypothyroidism	K	KH	Y	Lecture, Small group	Written/ Viva voce		Physiology, General Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
PA32.4	Classify and describe the epidemiology, etiology, pathogenesis, pathology, clinical laboratory features, complications and progression of diabetes mellitus	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, General Medicine	
PA32.5	Describe the etiology, genetics, pathogenesis, manifestations, laboratory and morphologic features of hyperparathyroidism	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Physiology, General Medicine	
PA32.6	Describe the etiology, pathogenesis, manifestations, laboratory, morphologic features, complications and metastases of pancreatic cancer	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
PA32.7	Describe the etiology, pathogenesis, manifestations, laboratory, morphologic features, complications of adrenal insufficiency	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Physiology, General Medicine	
PA32.8	Describe the etiology, pathogenesis, manifestations, laboratory, morphologic features, complications of Cushing's syndrome	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Physiology, General Medicine	
PA32.9	Describe the etiology, pathogenesis, manifestations, laboratory and morphologic features of adrenal neoplasms	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy, Physiology, General Medicine, General Surgery	
Topic: Bone and soft tissue		**Number of competencies: (05)**				**Number of procedures that require certification: (NIL)**			
PA33.1	Classify and describe the etiology, pathogenesis, manifestations, radiologic and morphologic features and complications of osteomyelitis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy, Orthopaedics	Microbiology
PA33.2	Classify and describe the etiology, pathogenesis, manifestations, radiologic and morphologic features and complications and metastases of bone tumors	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Orthopaedics	
PA33.3	Classify and describe the etiology, pathogenesis, manifestations, radiologic and morphologic features and complications and metastases of soft tissue tumors	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Orthopaedics	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
PA33.4	Classify and describe the etiology, pathogenesis, manifestations, radiologic and morphologic features and complications of Paget's disease of the bone	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Orthopaedics	
PA33.5	Classify and describe the etiology, immunology, pathogenesis, manifestations, radiologic and laboratory features, diagnostic criteria and complications of rheumatoid arthritis	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
Topic: Skin		**Number of competencies: (04)**			**Number of procedures that require certification:(NIL)**				
PA34.1	Describe the risk factors pathogenesis, pathology and natural history of squamous cell carcinoma of the skin	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Dermatology, Venereology & Leprosy	
PA34.2	Describe the risk factors pathogenesis, pathology and natural history of basal cell carcinoma of the skin	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Dermatology, Venereology & Leprosy	
PA34.3	Describe the distinguishing features between a nevus and melanoma. Describe the etiology, pathogenesis, risk factors morphology clinical features and metastases of melanoma	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Dermatology, Venereology & Leprosy	
PA34.4	Identify, distinguish and describe common tumors of the skin	S	SH	N	DOAP session	Skill Assessment		Dermatology, Venereology & Leprosy	
Topic: Central Nervous System		**Number of competencies:(03)**			**Number of procedures that require certification: (01)**				
PA35.1	Describe the etiology, types and pathogenesis, differentiating factors, CSF findings in meningitis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
PA35.2	Classify and describe the etiology, genetics, pathogenesis, pathology, presentation sequelae and complications of CNS tumors	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
PA35.3	Identify the etiology of meningitis based on given CSF parameters	S	P	Y	DOAP session	Skill Assessment	1	General Medicine	Microbiology
Topic: Eye		**Number of competencies: (01)**				**Number of procedures that require certification:(NIL)**			
PA36.1	Describe the etiology, genetics, pathogenesis, pathology, presentation, sequelae and complications of retinoblastoma	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Ophthalmology	

Column C: K- Knowledge, S – Skill, A - Attitude / professionalism, C- Communication.
Column D: K – Knows, KH - Knows How, S - Shows how, P- performs independently,
Column F: DOAP session – Demonstrate, Observe, Assess, Perform.
Column H: If entry is P: indicate how many procedures must be done independently for certification/ graduation

Integration

				Human Anatomy					
AN5.8	Define thrombosis, infarction & aneurysm	K	KH	N	Lecture	Written		Pathology	Physiology
AN66.2	Describe the ultrastructure of connective tissue	K	KH	N	Lecture, Practical	Written		Pathology	
AN70.1	Identify exocrine gland under the microscope & distinguish between serous, mucous and mixed acini	K/S	SH	Y	Lecture, Practical	Written/ skill assessment		Pathology	
AN70.2	Identify the lymphoid tissue under the microscope & describe microanatomy of lymph node, spleen, thymus, tonsil and correlate the structure with function	K/S	SH	Y	Lecture, Practical	Written/ skill assessment		Pathology	
AN71.1	Identify bone under the microscope, Classify various types and describe the structure-function correlation of the same	K/S	SH	Y	Lecture, Practical	Written/ skill assessment		Pathology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
AN71.2	Identify cartilage under the microscope & describe various types and structure- function correlation of the same describe various types and structure-function correlation of the same	K/S	SH	Y	Lecture, Practical	Written/ skill assessment		Pathology	
Physiology									
PY1.4	Describe apoptosis – programmed cell death	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
PY2.5	Describe different types of anemia & Jaundice	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	Biochemistry
PY2.8	Describe the physiological basis of hemostasis and anticoagulants. Describe bleeding & clotting disorders (Hemophilia, purpura)	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
PY2.9	Describe different blood groups and discuss the clinical importance of blood grouping, blood banking and transfusion	K	KH	Y	Lecture, Small group discussion, ECE- Visit to blood bank	Written/ Viva voce		Pathology	
PY2.11	Estimate Hb, RBC, TLC, RBC indices, DLC, Blood groups, BT/CT	S	SH	Y	DOAP sessions	Practical/OSPE/ viva voce		Pathology	
PY2.12	Describe test for ESR, Osmotic fragility, Hematocrit. Note the findings and interpret the test results etc	K	KH	Y	Demonstration	Written/ Viva voce		Pathology	
PY2.13	Describe steps for reticulocyte and platelet count	K	KH	Y	Demonstration sessions	Written/ Viva voce		Pathology	
PY3.6	Describe the pathophysiology of Myasthenia gravis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
Biochemistry									
BI2.4	Describe and discuss enzyme inhibitors as poisons and drugs and as therapeutic enzymes	K	KH	Y	Lecture, small group discussions	Written/ Viva voce		Pathology, General Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
BI2.5	Describe and discuss the clinical utility of various serum enzymes as markers of pathological conditions	K	KH	Y	Lecture, small group discussions	Written/ Viva voce		Pathology, General Medicine	
BI2.6	Discuss use of enzymes in laboratory investigations (Enzyme-based assays)	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, General Medicine	
BI2.7	Interpret laboratory results of enzyme activities & describe the clinical utility of various enzymes as markers of pathological conditions	K	KH	Y	Lecture, Small group discussion /DOAP sessions	Written/ Viva voce		Pathology, General Medicine	
BI3.8	Discuss and interpret laboratory results of analytes associated with metabolism of carbohydrates.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, General Medicine	
BI5.2	Describe and discuss functions of proteins and structure-function relationships in relevant areas eg, hemoglobin and selected hemoglobinopathies	K	KH	Y	Lecture, Small group discussions	Written/ Viva voce		Pathology, General Medicine	Physiology
BI6.11	Describe the functions of haem in the body and describe the processes involved in its metabolism and describe porphyrin metabolism	K	KH	Y	Lecture, Small group discussions	Written/ Viva voce		Pathology, General Medicine	Physiology
BI6.12	Describe the major types of haemoglobin and its derivatives found in the body and their physiological/ pathological relevance	K	KH	Y	Lecture, Small group discussions	Written/ Viva voce		Pathology, General Medicine	Physiology
BI6.13	Describe the functions of the kidney, liver, thyroid and adrenal glands.	K	KH	Y	Lecture, Small group discussions	Written/ Viva voce		Pathology, General Medicine	Physiology, Human Anatomy
BI6.14	Describe the tests that are commonly done in clinical practice to assess the functions of kidney, liver, thyroid and adrenal glands	K	KH	Y	Lecture, Small group discussions	Written/ Viva voce		Pathology, General Medicine	Physiology, Human Anatomy

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
BI6.15	Describe the abnormalities of kidney, liver, thyroid and adrenal glands	K	KH	Y	Lecture, Small group discussions	Written/ Viva voce		Pathology, General Medicine	Physiology, Human Anatomy
BI7.7	Describe the role of oxidative stress in the pathogenesis of conditions such as cancer, complications of diabetes mellitus and atherosclerosis	K	KH	Y	Lecture, Small group discussions	Written/ Viva voce		General Medicine, Pathology	
BI8.1	Discuss the importance of various dietary components and explain importance of dietary fibre	K	KH	Y	Lecture, Small group discussions	Written/ Viva voce		General Medicine, Pediatrics, Pathology	
BI8.2	Describe the types and causes of protein energy malnutrition and its effects	K	KH	Y	Lecture, Small group discussions	Written/ Viva voce		General Medicine, Pediatrics, Pathology	
BI8.4	Describe the causes (including dietary habits), effects and health risks associated with being overweight/obesity	K	KH	Y	Lecture, Small group discussions	Written/ Viva voce		General Medicine, Pathology	
BI8.5	Summarize the nutritional importance of commonly used items of food including fruits and vegetables (macro-molecules & its importance)	K	KH	Y	Lecture, Small group discussions	Written/ Viva voce		Community Medicine, General Medicine, Pediatrics	
BI10.1	Describe the cancer initiation, promotion oncogenes & oncogene activation	K	KH	Y	Lecture, Small group discussions	Written/ Viva voce		Obstetrics & Gynaecology, General Surgery, Pathology	
BI10.2	Describe various biochemical tumor markers and the biochemical basis of cancer therapy	K	KH	Y	Lecture, Small group discussions	Written/ Viva voce		Obstetrics & Gynaecology, General Surgery, Pathology	
BI10.3	Describe the cellular and humoral components of the immune system & describe the types and structure of antibody	K	KH	Y	Lecture, Small group discussions	Written/ Viva voce		Obstetrics & Gynaecology, General Surgery, Pathology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
BI10.4	Describe & discuss innate and adaptive immune responses, self/non-self recognition and the central role of T-helper cells in immune responses	K	KH	Y	Lecture, Small group discussions	Written/ Viva voce		General Medicine, Pathology	Physiology
BI10.5	Describe antigens and concepts involved in vaccine development	K	KH	Y	Lecture, Small group discussions	Written/ Viva voce		Pathology, Pediatrics, Microbiology	
BI11.17	Explain the basis and rationale of biochemical tests done in the following conditions: diabetes mellitus, dyslipidemia, myocardial infarction, renal failure, gout, proteinuria, nephrotic syndrome, edema, jaundice, liver diseases, pancreatitis, disorders of acid-base balance, thyroid disorders	K	KH	Y	Lecture, Small group discussions	Written/ Viva voce		General Medicine, Pathology	
Microbiology									
MI1.7	Describe the immunological mechanisms in health	K	KH	Y	Lecture	Written/ Viva voce			Pathology
MI1.8	Describe the mechanisms of immunity and response of the host immune system to infections	K	KH	Y	Lecture	Written/ Viva voce		Pediatrics	Pathology
MI2.1	Describe the etiologic agents in rheumatic fever and their diagnosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Pathology
MI2.2	Describe the classification etio-pathogenesis, clinical features and discuss the diagnostic modalities of Infective endocarditis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Pathology
MI2.3	Identify the microbial agents causing Rheumatic heart disease & infective Endocarditis	S	SH	Y	DOAP session	Skill assessment		General Medicine	Pathology
MI2.4	List the common microbial agents causing anemia. Describe the morphology, mode of infection and discuss the pathogenesis, clinical course, diagnosis and prevention and treatment of the common microbial agents causing Anemia	K	KH	Y	Lecture, Small group discussion	Written/ viva voce		General Medicine	Pathology

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
MI2.5	Describe the etio-pathogenesis and discuss the clinical evolution and the laboratory diagnosis of kala azar, malaria, filariasis and other common parasites prevalent in India	K	KH	Y	Lecture, Small group discussion	Written/ viva voce		General Medicine	Pathology
MI2.7	Describe the epidemiology, the etio-pathogenesis, evolution, complications, opportunistic infections, diagnosis, prevention and the principles of management of HIV	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Pathology
MI3.1	Enumerate the microbial agents causing diarrhea and dysentery. Describe the epidemiology, morphology, pathogenesis, clinical features, and diagnostic modalities of these agents	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Pediatrics	Pathology
MI3.3	Describe the enteric fever pathogens and discuss the evolution of the clinical course, the laboratory diagnosis of the diseases caused by them	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Pharmacology, Pathology
MI3.4	Identify the different modalities for diagnosis of enteric fever. Choose the appropriate test related to the duration of illness	S	KH	Y	DOAP session	Skill assessment		General Medicine	Pathology
MI3.6	Describe the etio-pathogenesis of Acid Peptic disease (APD) and the clinical course. Discuss the diagnosis and management of the causative agent of APD.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Pharmacology, Pathology
MI3.7	Describe the epidemiology, the etio-pathogenesis and discuss the viral markers in the evolution of Viral hepatitis. Discuss the modalities in the diagnosis, and prevention of viral hepatitis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Pathology
MI3.8	Choose the appropriate laboratory test in the diagnosis of viral hepatitis	K	KH	Y	small group discussion, Case discussion	Written/ Viva voce/ OSPE		General Medicine	Pathology
MI5.1	Describe the etiopathogenesis, clinical course and discuss the laboratory diagnosis of meningitis	K	KH	Y	Lecture	Written/ Viva voce		General Medicine, Pediatrics	Pathology
MI5.2	Describe the etiopathogenesis, clinical course and discuss the laboratory diagnosis of encephalitis.	K	KH	Y	Lecture	Written/ Viva voce		General Medicine, Pediatrics	Pathology

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
MI8.2	Describe the etio-pathogenesis of opportunistic infections (OI) and discuss the factors contributing to the occurrence of OI, and the laboratory diagnosis	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Pathology
MI8.3	Describe the role of oncogenic viruses in the evolution of virus associated malignancy	K	KH	Y	Lecture	Written		General Medicine	Pathology
Community Medicine									
CM8.1	Describe and discuss the epidemiological and control measures including the use of essential laboratory tests at the primary care level for communicable diseases	K	KH	Y	Small group discussion, Lecture	Written/ Viva voce		General Medicine, Pediatrics	Microbiology, Pathology
Forensic Medicine & Toxicology									
FM2.1	Define, describe and discuss death and its types including somatic/clinical/cellular, molecular and brain-death, Cortical death and Brainstem death	K	KH	Y	Lecture, Small group discussion	Written/viva voce			Pathology
FM2.2	Describe and discuss natural and unnatural deaths	K	KH	Y	Lecture, Small group discussion	Written/viva voce			Pathology
FM2.3	Describe and discuss issues related to sudden natural deaths	K	KH	Y	Lecture, Small group discussion	Written/viva voce			Pathology
FM2.5	Discuss moment of death, modes of death-coma, asphyxia and syncope	K	KH	Y	Lecture, Small group discussion	Written/viva voce			Pathology
FM2.11	Describe and discuss autopsy procedures including post-mortem examination, different types of autopsies, aims and objectives of post-mortem examination	K	KH	Y	Lecture, Small group discussion, Autopsy, DOAP session	Written/viva voce/ OSPE			Pathology
FM2.12	Describe the legal requirements to conduct post-mortem examination and procedures to conduct medico-legal post-mortem examination	K	KH	Y	Lecture, Small group discussion, Autopsy, DOAP session	Written/viva voce/ OSPE			Pathology

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
FM2.13	Describe and discuss obscure autopsy	K	KH	Y	Lecture, Small group discussion	Written/viva voce			Pathology
FM3.28	Describe evidences of abortion - living and dead, duties of doctor in cases of abortion, investigations of death due to criminal abortion	K	K/KH	Y	Lecture, Small group discussion	Written/viva voce		Obstetrics & Gynaecology, Pathology	
FM6.1	Describe different types of specimens and tissues to be collected both in the living and dead: body fluids (blood, urine, semen, faeces, saliva), skin, nails, tooth pulp, vaginal smear, viscera, skull, specimen for histo-pathological examination, blood grouping, HLA Typing and DNA Fingerprinting. Describe Locard's Exchange Principle	K	K/KH	Y	Lecture, Small group discussion	Written/viva voce			Pathology
FM14.7	Demonstrate & identify that a particular stain is blood and identify the species of its origin	S	KH	Y	Small group discussion, Lecture	Log book/ skill station/ Viva voce		Forensic Medicicne, Physiology	
FM14.8	Demonstrate the correct technique to perform and identify ABO & RH blood group of a person	S	SH	Y	Small group discussion, DOAP session	Log book/ skill station/ Viva voce		Forensic Medicicne, Physiology	
Dermatology, Venereology & Leprosy									
DR12.7	Identify and distinguish fixed drug eruptions and Steven Johnson syndrome from other skin lesions	S	SH	Y	Bedside clinic	Skill assessment	1	General Medicine	Pathology, Microbiology
DR14.1	Describe the etiology, pathogenesis and clinical precipitating features and classification of Urticaria and angioedema	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Microbiology, Pathology
DR16.1	Identify and distinguish skin lesions of SLE	S	SH	Y	Bedside clinic discussion	Skill assessment	2	General Medicine	Pathology
DR16.2	Identify and distinguish Raynaud's phenomenon	S	SH	Y	Bedside clinic discussion	Skill assessment	2	General Medicine	Pathology
Anesthesiology									

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
AS9.4	Enumerate blood products and describe the use of blood products in the preoperative period	K	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce		Pathology	General Surgery
ENT									
EN1.2	Describe the pathophysiology of common diseases in ENT	K	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce		Pathology	
Ophthalmology									
OP7.2	Describe and discuss the aetio-pathogenesis, stages of maturation and complications of cataract	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
OP8.1	Discuss the aetiology, pathology, clinical features and management of vascular occlusions of the retina	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy, Pathology	
Dentistry									
DE4.1	Discuss the prevalence of oral cancer and enumerate the common types of cancer that can affect tissues of the oral cavity	K	K	N	Lecture, Small group discussion	Viva voce		Pathology	ENT
DE4.2	Discuss the role of etiological factors in the formation of precancerous /cancerous lesions	K	KH	Y	Lecture, Small group discussion	Viva voce		Pathology	ENT
DE4.3	Identify potential pre-cancerous / cancerous lesions	S	SH	N	Observation, Bed side clinics	Skill assessment		Pathology	ENT
DE4.4	Counsel patients to risks of oral cancer with respect to tobacco, smoking, alcohol and other causative factors.	A/C	SH	Y	DOAP session	Document in Log book	2	Pathology	ENT
General Medicine									

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
IM1.1	Describe and discuss the epidemiology, pathogenesis clinical evolution and course of common causes of heart disease including: rheumatic/ valvular, ischemic, hypertrophic inflammatory	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM1.2	Describe and discuss the genetic basis of some forms of heart failure	K	KH	N	Lecture, Small group discussion	Written		Pathology, Physiology	
IM1.3	Describe and discuss the aetiology, microbiology, pathogenies and clinical evolution of rheumatic fever, criteria, degree of rheumatic activity and rheumatic valvular heart disease and its complications including infective endocarditis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology, Microbiology	
IM1.4	Stage heart failure	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM1.5	Describe, discuss and differentiate the processes involved in R vs L heart failure, systolic vs diastolic failure	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM1.6	Describe and discuss the compensatory mechanisms involved in heart failure including cardiac remodelling and neurohormonal adaptations	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM1.7	Enumerate, describe and discuss the factors that exacerbate heart failure including ischemia, arrythmias, anemia, thyrotoxicosis, dietary factors drugs etc.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM1.8	Describe and discuss the pathogenesis and development of common arrhythmias involved in heart failure particularly atrial fibrillation	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM1.9	Describe and discuss the clinical presentation and features, diagnosis, recognition and management of acute rheumatic fever	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Microbiology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
IM2.1	Discuss and describe the epidemiology, antecedents and risk factors for atherosclerosis and ischemic heart disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology, Community Medicine	
IM2.2	Discuss the aetiology of risk factors both modifiable and non-modifiable of atherosclerosis and IHD	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM2.4	Discuss and describe the pathogenesis natural history, evolution and complications of atherosclerosis and IHD	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM2.5	Define the various acute coronary syndromes and describe their evolution, natural history and outcomes	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM3.1	Define, discuss, describe and distinguish community acquired pneumonia, nosocomial pneumonia and aspiration pneumonia	K	K	Y	Lecture , Small group discussion	short note/ Viva voce		Human Anatomy, Pathology, Microbiology	
IM3.3	Discuss and describe the pathogenesis, presentation, natural history and complications of pneumonia	K	K	Y	Lecture, Small group discussion	short note/ Viva voce		Pathology, Microbiology	
IM4.5	Describe and discuss the pathophysiology and manifestations of malignant causes of fever including hematologic and lymph node malignancies	K	KH	Y	Lecture, Small group discussion	written		Pathology, Microbiology	
IM4.12	Order and interpret diagnostic tests based on the differential diagnosis including: CBC with differential, peripheral smear, urinary analysis with sediment, Chest X ray, blood and urine cultures, sputum gram stain and cultures, sputum AFB and cultures, CSF analysis, pleural and body fluid analysis, stool routine and culture and QBC	K	SH	Y	Bed side clinic, Skill assessment	Skill assessment		Pathology, Microbiology	
IM4.16	Enumerate the indications and describe the findings in tests of inflammation and specific rheumatologic tests, serologic testing for pathogens including HIV, bone marrow aspiration and biopsy	K	KH	N	Lecture, Small group discussion	written		Pathology	
IM4.17	Observe and assist in the performance of a bone marrow aspiration and biopsy in a simulated environment	S	SH	N	skills lab	log book documentation/ DOAP session		Pathology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
IM5.1	Describe and discuss the physiologic and biochemical basis of hyperbilirubinemia	K	K	Y	Lecture, Small group discussion	Written/Viva voce		Pathology, Physiology	
IM5.2	Describe and discuss the aetiology and pathophysiology of liver injury	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM5.3	Describe and discuss the pathologic changes in various forms of liver disease	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM5.4	Describe and discuss the epidemiology, microbiology, immunology and clinical evolution of infective (viral) hepatitis	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Microbiology	
IM5.5	Describe and discuss the pathophysiology and clinical evolution of alcoholic liver disease	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM5.6	Describe and discuss the pathophysiology, clinical evolution and complications of cirrhosis and portal hypertension including ascites, spontaneous bacterial peritonitis, hepatorenal syndrome and hepatic encephalopathy	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM5.7	Enumerate and describe the causes and pathophysiology of drug induced liver injury	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Pharmacology	
IM5.12	Choose and interpret appropriate diagnostic tests including: CBC, bilirubin, function tests, Hepatitis serology and ascitic fluid examination in patient with liver diseases	S	KH	Y	Bedside clinic, DOAP session	Skill assessment		Pathology	
IM5.14	Outline a diagnostic approach to liver disease based on hyperbilirubinemia, liver function changes and hepatitis serology	S	SH	Y	Bedside clinic, Small group discussion	viva voce/ written		Pathology, Microbiology	
IM6.5	Describe and discuss the pathogenesis, evolution and clinical features of common HIV related malignancies	K	KH	Y	Lecture, Small group discussion	short notes/ Viva voce		Pathology, Microbiology	
IM6.6	Describe and discuss the pathogenesis, evolution and clinical features of common HIV related skin and oral lesions	K	KH	Y	Lecture, Small group discussion	short notes/ Viva voce		Pathology, Microbiology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
IM6.10	Choose and interpret appropriate diagnostic tests to diagnose and classify the severity of HIV-AIDS including specific tests of HIV, CDC	K	KH	Y	Bed side clinic, DOAP session, Small group discussion	written/ Skill assessment		Pathology, Microbiology	
IM6.19	Enumerate the indications of and discuss about prophylactic drugs used to prevent HIV related opportunistic infections	K/C	K	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Microbiology	
IM7.1	Describe the pathophysiology of autoimmune disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM7.2	Describe the genetic basis of autoimmune disease	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM7.16	Enumerate the indications for and interpret the results of: CBC, anti CCP (Anti-cyclic citrullinated peptide), RA, ANA, DNA and other tests of autoimmunity	K	SH	Y	Bed side clinic, small group	Skill assessment/ written		Pathology	
IM8.1	Describe and discuss the epidemiology, aetiology and the prevalence of primary and secondary hypertension	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM8.2	Describe and discuss the pathophysiology of hypertension	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM8.3	Describe and discuss the genetic basis of hypertension	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM8.4	Define and classify hypertension	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM8.5	Describe and discuss the differences between primary and secondary hypertension	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM8.7	Describe and discuss the clinical manifestations of the various aetiologies of secondary causes of hypertension	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM8.8	Describe, discuss and identify target organ damage due to hypertension	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
IM9.1	Define, describe and classify anemia based on red blood cell size and reticulocyte count	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM9.2	Describe and discuss the morphological characteristics, aetiology and prevalence of each of the causes of anemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM9.6	Generate a differential diagnosis and prioritise based on clinical features that suggest a specific aetiology	S	SH	Y	Bed side clinic, DOAP session, Small group discussion	Skill assessment/ written		Pathology	
IM9.7	Describe the appropriate diagnostic work up based on the presumed aetiology	S	SH	Y	Bed side clinic, DOAP session	Skill assessment/ written		Pathology	
IM9.8	Describe and discuss the meaning and utility of various components of the hemogram	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce/ Skill assessment		Pathology	
IM9.9	Describe and discuss the various tests for iron deficiency	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce/ Skill assessment		Pathology	
IM9.10	Order and interpret tests for anemia including hemogram, red cell indices, reticulocyte count, iron studies, B12 and folate.	S	SH	Y	Bed side clinic, DOAP session	Skill assessment/ written		Pathology	
IM9.11	Describe, perform and interpret a peripheral smear and stool occult blood	S	SH	P	Bed side clinic, DOAP session	Skill assessment/ written		Pathology	
IM9.12	Describe the indications and interpret the results of a bone marrow aspirations and biopsy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce/ Skill assessment		Pathology	
IM9.13	Describe, develop a diagnostic plan to determine the aetiology of anemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce/ Skill assessment		Pathology	
IM9.18	Describe the indications for blood transfusion and the appropriate use of blood components	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce/ Skill assessment		Pathology	
IM10.1	Define, describe and differentiate between acute and chronic renal failure	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
IM10.2	Classify, describe and differentiate the pathophysiologic causes of acute renal failure	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM10.3	Describe the pathophysiology and causes of pre renal ARF, renal and post renal ARF	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM10.4	Describe the evolution, natural history and treatment of ARF	K	KH	Y	Lecture, small group	Written/ Viva voce		Pathology	
IM10.5	Describe and discuss the aetiology of CRF	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM10.6	Stage Chronic Kidney Disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM10.7	Describe and discuss the pathophysiology and clinical findings of uraemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM10.8	Classify, describe and discuss the significance of proteinuria in CKD	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM10.9	Describe and discuss the pathophysiology of anemia and hyperparathyroidism in CKD	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM10.10	Describe and discuss the association between CKD glycemia and hypertension	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM10.11	Describe and discuss the relationship between CAD risk factors and CKD and in dialysis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM10.16	Enumerate the indications for and interpret the results of: renal function tests, calcium, phosphorus, PTH, urine electrolytes, osmolality, Anion gap	K	KH	Y	DOAP session, Small group discussion	Skill assessment/ Written/ Viva voce		Pathology	
IM10.17	Describe and calculate indices of renal function based on available laboratories including FENa (Fractional Excretion of Sodium) and CrCl (Creatinine Clearance)	S	SH	Y	DOAP session, Small group discussion	Skill assessment/ Written/ Viva voce		Pathology	
IM11.2	Describe and discuss the epidemiology and pathogenesis and risk factors and clinical evolution of type 1 diabetes	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
IM11.3	Describe and discuss the epidemiology and pathogenesis and risk factors, economic impact and clinical evolution of type 2 diabetes	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM11.5	Describe and discuss the pathogenesis and temporal evolution of microvascular and macrovascular complications of diabetes	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM11.11	Order and interpret laboratory tests to diagnose diabetes and its complications including: glucoses, glucose tolerance test, glycosylated hemoglobin, urinary micro albumin, ECG, electrolytes, ABG, ketones, renal function tests and lipid profile	S	SH	Y	Bed side clinic, DOAP session, Small group discussion	Skill assessment		Pathology	
IM11.12	Perform and interpret a capillary blood glucose test	S	P	Y	Bed side clinic, DOAP session, Small group discussion	Skill assessment	2	Pathology, Biochemistry	
IM11.13	Perform and interpret a urinary ketone estimation with a dipstick	S	P	Y	Bed side clinic, DOAP session	Skill assessment	2	Pathology, Biochemistry	
IM11.22	Enumerate the causes of hypoglycaemia and describe the counter hormone response and the initial approach and treatment	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM12.1	Describe the epidemiology and pathogenesis of hypothyroidism and hyperthyroidism including the influence of iodine deficiency and autoimmunity in the pathogenesis of thyroid disease	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM12.3	Describe and discuss the physiology of the hypothalamo-pituitary - thyroid axis, principles of thyroid function testing and alterations in physiologic function	K	K	Y	Lecture, Small group discussion	short notes		Pathology, Physiology	
IM13.1	Describe the clinical epidemiology and inherited & modifiable risk factors for common malignancies in India	K	K	Y	Lecture, Small group discussion	short note/ Viva voce		Pathology, Biochemistry	
IM13.2	Describe the genetic basis of selected cancers	K	K	N	Lecture, Small group discussion	short note/ Viva voce		Pathology	

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IM13.3	Describe the relationship between infection and cancers	K	K	Y	Lecture, Small group discussion	short note/ Viva voce		Pathology, Microbiology	
IM13.4	Describe the natural history, presentation, course, complications and cause of death for common cancers	K	K	Y	Lecture, Small group discussion	Short note/ Viva voce		Pathology	
IM13.15	Describe the need, tests involved, their utility in the prevention of common malignancies	K	KH	Y	Bedside clinic, small group discussion	short note/ Viva voce		Pathology	
IM14.2	Describe and discuss the aetiology of obesity including modifiable and non-modifiable risk factors and secondary causes	K	K	Y	Lecture, Small group discussion	short note/ Viva voce		Pathology	
IM14.3	Describe and discuss the monogenic forms of obesity	K	K	N	Lecture, Small group discussion	short note/ Viva voce		Pathology	
IM14.4	Describe and discuss the impact of environmental factors including eating habits, food, work, environment and physical activity on the incidence of obesity	K	K	Y	Lecture, Small group discussion	Short note/ Viva voce		Pathology, Community Medicine	
IM14.5	Describe and discuss the natural history of obesity and its complications	K	K	Y	Lecture, Small group discussion	short note/ Viva voce		Pathology	
IM15.1	Enumerate, describe and discuss the aetiology of upper and lower GI bleeding	K	K	Y	Lecture, Small group discussion	short note/ Viva voce		Pathology	General Surgery
IM15.2	Enumerate, describe and discuss the evaluation and steps involved in stabilizing a patient who presents with acute volume loss and GI bleed	S	SH	Y	DOAP session, Small group discussion, Lecture	Written/ Viva voce/ Skill assessment		Pathology	General Surgery
IM15.3	Describe and discuss the physiologic effects of acute blood and volume loss	K	K	Y	Lecture, Small group discussion	Short note/ viva voce		Pathology, Physiology	General Surgery
IM15.9	Choose and interpret diagnostic tests based on the clinical diagnosis including complete blood count, PT and PTT, stool examination, occult blood, liver function tests, H.pylori test	S	SH	Y	Bedside clinic, DOAP session, Small group discussion	Skill assessment/ Short note/ Viva voce		Pathology	General Surgery

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IM15.11	Develop document and present a treatment plan that includes fluid resuscitation, blood and blood component transfusion and specific therapy for arresting blood loss	S	KH	Y	Lecture, Small group discussion	Short note/ viva voce		Pathology	General Surgery
IM15.12	Enumerate the indications for whole blood, component and platelet transfusion and describe the clinical features and management of a mismatched transfusion	K	K	Y	Lecture, Small group discussion	Short note/ viva voce		Pathology	General Surgery
IM15.13	Observe cross matching and blood / blood component transfusion	S	SH	Y	Bedside clinic	Short note/ Viva voce/ Skill assessment		Pathology	General Surgery
IM16.4	Elicit and document and present an appropriate history that includes the natural history, dietary history, travel, sexual history and other concomitant illnesses	S	SH	Y	Bedside clinic skills lab	Skill assessment		Microbiology, Pathology	
IM16.8	Choose and interpret diagnostic tests based on the clinical diagnosis including complete blood count, and stool examination	S	SH	Y	Bedside clinic, Skills lab, Small group discussion	Skill assessment/ Short note/ Viva voce		Microbiology, Pathology	
IM16.12	Enumerate and discuss the indications for further investigations including antibodies, colonoscopy, diagnostic imaging and biopsy in the diagnosis of chronic diarrhea	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	General Surgery
IM16.15	Distinguish, based on the clinical presentation, Crohn’s disease from ulcerative colitis	S	SH	Y	Lecture, Small group discussion	Short note/ Viva voce		Pathology	General Surgery
IM17.7	Enumerate the indications and describe the findings in the CSF in patients with meningitis	K	K	Y	Small group, Bedside clinic	Skill Assessment		Microbiology, Pathology	
IM17.8	Demonstrate in a mannequin or equivalent the correct technique for performing a lumbar puncture	S	SH	Y	DOAP session	Skill assessment		Microbiology, Pathology	
IM17.9	Interpret the CSF findings when presented with various parameters of CSF fluid analysis	S	SH	Y	Small group discussion, Bedside clinic	Skill assessment		Microbiology, Pathology	
IM18.2	Classify cerebrovascular accidents and describe the aetiology, predisposing genetic and risk factors pathogenesis of hemorrhagic and non hemorrhagic stroke	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	

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IM18.3	Elicit and document and present an appropriate history including onset, progression precipitating and aggravating relieving factors, associated symptoms that help identify the cause of the cerebrovascular accident	S	SH	Y	Bedside clinic	Skill assessment		Pathology	
IM22.1	Enumerate the causes of hypercalcemia and distinguish the features of PTH vs non PTH mediated hypercalcemia	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM22.2	Describe the aetiology, clinical manifestations, diagnosis and clinical approach to primary hyperparathyroidism	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Pathology	General Surgery
IM22.4	Enumerate the components and describe the genetic basis of the multiple endocrine neoplasia syndrome	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM25.7	Order and interpret diagnostic tests based on the differential diagnosis including: CBC with differential, blood biochemistry, peripheral smear, urinary analysis with sediment, Chest X ray, blood and urine cultures, sputum gram stain and cultures, sputum AFB and cultures, CSF analysis, pleural and body fluid analysis, stool routine and culture and QBC	K	SH	Y	Bed side clinic, Skill assessment	Skill assessment		Pathology, Microbiology	
Obstetrics & Gynaecology									
OG10.2	Enumerate the indications and describe the appropriate use of blood and blood products, their complications and management	K	KH	Y	Lecture, Small group discussion			Pathology	
Pediatrics									
PE11.1	Describe the common etiology, clinical features and management of obesity in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry, Pathology	
PE11.2	Discuss the risk approach for obesity and discuss the prevention strategies	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Pathology	

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PE12.7	Describe the causes, clinical features, diagnosis and management of deficiency /excess of Vitamin D (Rickets and Hypervitaminosis D)	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, Physiology, Pathology	
PE12.8	Identify the clinical features of dietary deficiency of Vitamin D	S	p	Y	Bedside clinics, Skills lab	Document in log book	3	Biochemistry, Physiology Pathology	
PE12.9	Assess patients with Vitamin D deficiency, diagnose, classify and plan management	S	SH	Y	Bed side clinics	Document in log book		Biochemistry, Physiology, Pathology	
PE12.13	Discuss the RDA , dietary sources of Vitamin K and their role in Health and disease	K	K	N	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, Physiology, Pathology	
PE12.14	Describe the causes, clinical features, diagnosis, management and prevention of Deficiency of Vitamin K	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, Physiology, Pathology	
PE13.1	Discuss the RDA, dietary sources of Iron and their role in health and disease	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Biochemistry	
PE13.2	Describe the causes, diagnosis and management of Fe deficiency	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology Biochemistry	
PE13.3	Identify the clinical features of dietary deficiency of Iron and make a diagnosis	S	SH	Y	Bed side clinics, Skill Lab	Document in log book		Pathology, Biochemistry	
PE13.4	Interpret hemogram and Iron Panel	S	P	Y	Bed side clinic, Small group discussion	Skill Assessment	5	Pathology, Biochemistry	
PE13.5	Propose a management plan for Fe Deficiency Anaemia	S	SH	Y	Bed side clinics, Skill lab	Skill Assessment		Pathology, Pharmacology	
PE21.2	Enumerate the etio-pathogenesis, clinical features, complications and management of Acute post streptococcal Glomerular Nephritis in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
PE21.3	Discuss the approach and referral criteria to a child with Proteinuria	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	

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PE21.5	Enumerate the etio-pathogenesis clinical features, complications and management of Acute Renal Failure in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
PE21.6	Enumerate the etio-pathogenesis, clinical features, complications and management of Chronic renal Failure in Children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
PE21.7	Enumerate the etio-pathogenesis clinical features, complications and management of Wilms Tumor	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
PE21.11	Perform and interpret the common analytes in a Urine examination	S	SH	Y	Bed side clinic Labs, Skill lab	Skill assessment		Biochemistry, Pathology	
PE23.1	Discuss the Hemodynamic changes, clinical presentation, complications and management of Acyanotic Heart Diseases –VSD, ASD and PDA	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Pathology	
PE23.2	Discuss the Hemodynamic changes, clinical presentation, complications and management of Cyanotic Heart Diseases – Fallot's Physiology	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Pathology	
PE23.3	Discuss the etio-pathogenesis, clinical presentation and management of cardiac failure in infant and children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Pathology	
PE23.4	Discuss the etio-pathogenesis, clinical presentation and management of Acute Rheumatic Fever in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Pathology	
PE23.5	Discuss the clinical features, complications, diagnosis, management and prevention of Acute Rheumatic Fever	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Pathology	
PE23.6	Discuss the etio-pathogenesis and clinical features and management of Infective endocarditis in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Pathology, Microbiology	
PE24.1	Discuss the etio-pathogenesis, classification, clinical presentation and management of diarrheal diseases in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Microbiology	

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PE24.2	Discuss the classification and clinical presentation of various types of diarrheal dehydration	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Microbiology	
PE25.1	Discuss the etio-pathogenesis, clinical presentation and management of Malabsorption in children and its causes including celiac disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
PE26.1	Discuss the etio-pathogenesis, clinical features and management of acute hepatitis in children	K	KH	Y	Lecture, Small group activity	Written/ Viva voce		Pathology, Microbiology	
PE26.2	Discuss the etio-pathogenesis, clinical features and management of Fulminant Hepatic Failure in children	K	KH	Y	Lecture, Small group activity	Written/ Viva voce		Pathology, Microbiology	
PE26.3	Discuss the etio-pathogenesis, clinical features and management of chronic liver diseases in children	K	KH	Y	Lecture, Small group activity	Written/ Viva voce		Pathology, Microbiology	
PE26.4	Discuss the etio-pathogenesis, clinical features and management of Portal Hypertension in children	K	KH	Y	Lecture, Small group activity	Written/ Viva voce		Pathology	
PE26.9	Interpret Liver Function Tests, viral markers, ultra sonogram report	S	SH	Y	Bedside clinics, Skills lab	Skill Assessment		Pathology	
PE29.1	Discuss the etio-pathogenesis, clinical features, classification and approach to a child with anaemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
PE29.2	Discuss the etio-pathogenesis, clinical features and management of Iron Deficiency anaemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
PE29.3	Discuss the etiopathogenesis, clinical features and management of VIT B12, Folate deficiency anaemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
PE29.4	Discuss the etio-pathogenesis, clinical features and management of Hemolytic anemia, Thalassemia Major, Sickle cell anaemia, Hereditary spherocytosis, Auto-immune hemolytic anaemia and hemolytic uremic syndrome	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
PE29.6	Discuss the cause of thrombocytopenia in children: describe the clinical features and management of Idiopathic Thrombocytopenic Purpura (ITP)	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Pathology	
PE29.7	Discuss the etiology, classification, pathogenesis and clinical features of Hemophilia in children	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Pathology	
PE29.8	Discuss the etiology, clinical presentation and management of Acute Lymphoblastic Leukemia in children	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Pathology	
PE29.9	Discuss the etiology, clinical presentation and management of lymphoma in children	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Pathology	
General Surgery									
SU2.1	Describe pathophysiology of shock, types of shock, principles of resuscitation including fluid replacement and monitoring	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
SU3.1	Describe the indications and appropriate use of blood and blood products and complications of blood transfusion.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce.		Pathology	
SU5.1	Describe normal wound healing and factors affecting healing.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
SU9.1	Choose appropriate biochemical, microbiological, pathological, imaging investigations and interpret the investigative data in a surgical patient	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, Microbiology, Pathology	
SU22.2	Describe the etiopathogenesis of thyroidal swellings	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology,	
Respiratory Medicine									
CT2.1	Define and classify obstructive airway disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Pathology	
CT2.2	Describe and discuss the epidemiology, risk factors and evolution of obstructive airway disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Pathology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
CT2.4	Describe and discuss the physiology and pathophysiology of hypoxia and hypercapnia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Pathology	
CT2.5	Describe and discuss the genetics of alpha 1 antitrypsin deficiency in emphysema	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Physiology, Pathology	
CT2.6	Describe the role of the environment in the cause and exacerbation of obstructive airway disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
CT2.7	Describe and discuss allergic and non-allergic precipitants of obstructive airway disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology,	
CT2.11	Describe, discuss and interpret pulmonary function tests	S	SH	Y	Bed side clinic, DOAP session	Skill assessment		Physiology, Pathology	
Orthopaedics									
OR3.1	Describe and discuss the aetiopathogenesis, clinical features, investigations and principles of management of Bone and Joint infections a) Acute Osteomyelitis b) Subacute osteomyelitis c) Acute Suppurative arthritis d) Septic arthritis & HIV infection e) Spirochaetal infection f) Skeletal Tuberculosis	K/S	K/KH/SH	Y	Lecture, Small group discussion, Video assisted lecture	Written/ Viva voce/ OSCE		Pathology, Microbiology	General surgery
OR4.1	Describe and discuss the clinical features, investigation and principles of management of Tuberculosis affecting major joints (Hip, Knee) including cold abcess and caries spine	K	K/KH	Y	Lecture, Small group discussion, Case discussion	Written/ Viva voce/ OSCE		Pathology	General surgery
OR10.1	Describe and discuss the aetiopathogenesis, clinical features, Investigations and principles of management of benign and malignant bone tumours and pathological fractures	K	K/KH	Y	Lecture, Small group discussion, Video assisted interactive lecture	Written/ Viva voce OSCE		Pathology	General surgery, Radiotherapy
Radiotherapy									

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical integration	Horizontal Integration
RT1.3	Enumerate, describe and discuss classification and staging of cancer (AJCC, FIGO etc.)	K	KH	Y	Lecture	Written/ Viva voce		Pathology	General Surgery, General Medicine
RT4.5	Describe and discuss role of radiation in management of common malignancies in India (region specific)	K	KH	Y	Lecture and Bed side clinic	Written/ Viva voce		Pathology	General Surgery, Obstetrics & Gynaecology
RT4.6	Describe and discuss radiotherapy for benign disease	K	KH	Y	Lecture	Written/ Viva voce		Pathology	General Surgery, Obstetrics & Gynaecology
RT4.7	Counsel patients regarding acute and late effects of radiation and supportive care	K/A/S	KH	Y	Bed side clinic, Group discussion	Written/ Viva voce		Pathology	General Surgery, Obstetrics & Gynaecology
RT5.1	Describe and discuss cancer prevention, screening, vaccination, cancer registry	K	K	Y	Group discussion	Written/ Viva voce		Pathology	General Surgery, Obstetrics & Gynaecology

MICROBIOLOGY (CODE: MI)

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
MICROBIOLOGY									
Topic: General Microbiology and Immunity		**Number of competencies: (11)**				**Number of procedures that require certification : (01)**			
MI1.1	Describe the different causative agents of Infectious diseases+A208, the methods used in their detection, and discuss the role of microbes in health and disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
MI1.2	Perform and identify the different causative agents of Infectious diseases by Gram Stain, ZN stain and stool routine microscopy	S	P	Y	DOAP session	Skill assessment	5		
MI1.3	Describe the epidemiological basis of common infectious diseases	K	KH	Y	Lecture	Written/ Viva voce			Community Medicine
MI1.4	Classify and describe the different methods of sterilization and disinfection. Discuss the application of the different methods in the laboratory, in clinical and surgical practice	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
MI1.5	Choose the most appropriate method of sterilization and disinfection to be used in specific situations in the laboratory, in clinical and surgical practice	K	KH	Y	Small group discussion, Case discussion	Written/Viva voce/ OSPE		General Surgery	
MI1.6	Describe the mechanisms of drug resistance, and the methods of antimicrobial susceptibility testing and monitoring of antimicrobial therapy	K	K	Y	Lecture, Small group discussion	Written/ Viva voce			Pharmacology
MI1.7	Describe the immunological mechanisms in health	K	KH	Y	Lecture	Written/ Viva voce			Pathology
MI1.8	Describe the mechanisms of immunity and response of the host immune system to infections	K	KH	Y	Lecture	Written/ Viva voce		Pediatrics	Pathology

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
MI1.9	Discuss the immunological basis of vaccines and describe the Universal Immunisation schedule	K	KH	Y	Lecture	Written/ Viva voce		Paediatrics	
MI1.10	Describe the immunological mechanisms in immunological disorder (hypersensitivity, autoimmune disorders and immunodeficiency states) and discuss the laboratory methods used in detection.	K	KH	Y	Lecture	Written/ Viva voce		Paediatrics	
MI1.11	Describe the immunological mechanisms of transplantation and tumor immunity	K	KH	Y	Lecture	Written/ Viva voce			
Topic: CVS and Blood		**Number of competencies: (7)**				**Number of procedures that require certification : (NIL)**			
MI2.1	Describe the etiologic agents in rheumatic fever and their diagnosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Pathology
MI2.2	Describe the classification etio-pathogenesis, clinical features and discuss the diagnostic modalities of Infective endocarditis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Pathology
MI2.3	Identify the microbial agents causing Rheumatic Heart Disease & infective Endocarditis	S	SH	Y	DOAP session	Skill assessment		General Medicine	Pathology
MI2.4	List the common microbial agents causing anemia. Describe the morphology, mode of infection and discuss the pathogenesis, clinical course, diagnosis and prevention and treatment of the common microbial agents causing Anemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Pathology
MI2.5	Describe the etio-pathogenesis and discuss the clinical evolution and the laboratory diagnosis of kalaazar, malaria, filariasis and other common parasites prevalent in India	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Pathology
MI2.6	Identify the causative agent of malaria and filariasis	K/S	SH	Y	DOAP session	Skill assessment		General Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
MI2.7	Describe the epidemiology, the etio- pathogenesis, evolution complications, opportunistic infections, diagnosis, prevention and the principles of management of HIV	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Pathology
Topic: Gastrointestinal and hepatobiliary system		**Number of competencies: (8)**			**Number of procedures that require certification : (NIL)**				
MI3.1	Enumerate the microbial agents causing diarrhea and dysentery. Describe the epidemiology, morphology, pathogenesis, clinical features and diagnostic modalities of these agents	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Paediatrics	Pathology
MI3.2	Identify the common etiologic agents of diarrhea and dysentery	S	SH	Y	DOAP session	Skill assessment		General Medicine, Paediatrics	
MI3.3	Describe the enteric fever pathogens and discuss the evolution of the clinical course and the laboratory diagnosis of the diseases caused by them	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Pharmacology, Pathology
MI3.4	Identify the different modalities for diagnosis of enteric fever. Choose the appropriate test related to the duration of illness	S	KH	Y	DOAP session	Skill assessment		General Medicine	Pathology
MI3.5	Enumerate the causative agents of food poisoning and discuss the pathogenesis, clinical course and laboratory diagnosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Pharmacology
MI3.6	Describe the etio-pathogenesis of Acid peptic disease (APD) and the clinical course. Discuss the diagnosis and management of the causative agent of APD	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Pharmacology, Pathology
MI3.7	Describe the epidemiology, the etio-pathogenesis and discuss the viral markers in the evolution of Viral hepatitis. Discuss the modalities in the diagnosis and prevention of viral hepatitis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Pathology

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
MI3.8	Choose the appropriate laboratory test in the diagnosis of viral hepatitis with emphasis on viral markers	K	KH	Y	Small group discussion, Case discussion	Written/ Viva voce/ OSPE		General Medicine	Pathology
Topic: Musculoskeletal system skin and soft tissue infections		**Number of competencies: (3)**			**Number of procedures that require certification : (NIL)**				
MI4.1	Enumerate the microbial agents causing anaerobic infections. Describe the etiopathogenesis, clinical course and discuss the laboratory diagnosis of anaerobic infections	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	
MI4.2	Describe the etiopathogenesis, clinical course and discuss the laboratory diagnosis of bone & joint infections	K	KH	Y	Lecture	Written/ Viva voce		Orthopaedics	
MI4.3	Describe the etio-pathogenesis of infections of skin and soft tissue and discuss the clinical course and the laboratory diagnosis	K	KH	Y	Lecture	Written/ Viva voce		Dermatology, Venereology & Leprosy, General Surgery	
Topic: Central Nervous System infections		**Number of competencies: (3)**			**Number of procedures that require certification : (NIL)**				
MI5.1	Describe the etiopathogenesis, clinical course and discuss the laboratory diagnosis of meningitis	K	KH	Y	Lecture	Written/ Viva voce		General Medicine, Pediatrics	Pathology
MI5.2	Describe the etiopathogenesis, clinical course and discuss the laboratory diagnosis of encephalitis	K	KH	Y	Lecture	Written/ Viva voce		General Medicine, Pediatrics	Pathology
MI5.3	Identify the microbial agents causing meningitis	S	SH	Y	DOAP session	Skill assessment		General Medicine, Pediatrics	
Topic: Respiratory tract infections		**Number of competencies: (3)**			**Number of procedures that require certification : (02)**				
MI6.1	Describe the etio-pathogenesis, laboratory diagnosis and prevention of Infections of upper and lower respiratory tract	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
MI6.2	Identify the common etiologic agents of upper respiratory tract infections (Gram Stain)	S	P	Y	DOAP session	Skill assessment	3	General Medicine	
MI6.3	Identify the common etiologic agents of lower respiratory tract infections (Gram Stain & Acid fast stain)	S	P	Y	DOAP session	Skill assessment	3	General Medicine	
Topic: Genitourinary & Sexually transmitted infections		**Number of competencies: (3)**				**Number of procedures that require certification : (NIL)**			
MI7.1	Describe the etio-pathogenesis and discuss the laboratory diagnosis of infections of genitourinary system	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
MI7.2	Describe the etio-pathogenesis and discuss the laboratory diagnosis of sexually transmitted infections. Recommend preventive measures	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Dermatology, Venereology & Leprosy, Obstetrics & Gynaecology	
MI7.3	Describe the etio-pathogenesis, clinical features, the appropriate method for specimen collection, and discuss the laboratory diagnosis of Urinary tract infections	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
Topic: Zoonotic diseases and miscellaneous		**Number of competencies: (16)**				**Number of procedures that require certification : (01)**			
MI8.1	Enumerate the microbial agents and their vectors causing Zoonotic diseases. Describe the morphology, mode of transmission, pathogenesis and discuss the clinical course, laboratory diagnosis and prevention	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
MI8.2	Describe the etio-pathogenesis of opportunistic infections (OI) and discuss the factors contributing to the occurrence of OI, and the laboratory diagnosis	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Pathology
MI8.3	Describe the role of oncogenic viruses in the evolution of virus associated malignancy	K	KH	Y	Lecture	Written		General Medicine	Pathology

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
MI8.4	Describe the etiologic agents of emerging Infectious diseases. Discuss the clinical course and diagnosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Community Medicine	
MI8.5	Define Healthcare Associated Infections (HAI) and enumerate the types. Discuss the factors that contribute to the development of HAI and the methods for prevention	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Community Medicine	
MI8.6	Describe the basics of Infection control	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Community Medicine
MI8.7	Demonstrate Infection control practices and use of Personal Protective Equipments (PPE)	S	P	Y	DOAP session	Skill assessment	3 each in (Hand hygiene & PPE)	General Surgery	Community Medicine
MI8.8	Describe the methods used and significance of assessing the microbial contamination of food, water and air	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
MI8.9	Discuss the appropriate method of collection of samples in the performance of laboratory tests in the detection of microbial agents causing infectious diseases	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
MI8.10	Demonstrate the appropriate method of collection of samples in the performance of laboratory tests in the detection of microbial agents causing Infectious diseases	S	SH	Y	DOAP session	Skill assessment			
MI8.11	Demonstrate respect for patient samples sent to the laboratory for performance of laboratory tests in the detection of microbial agents causing Infectious diseases	A	SH	Y	DOAP session	Skill assessment			
MI8.12	Discuss confidentiality pertaining to patient identity in laboratory results	A	KH	Y	Lecture, Small group discussion	Viva voce			
MI8.13	Choose the appropriate laboratory test in the diagnosis of the infectious disease	K	KH	Y	Small group discussions, Case discussion	Written/ Viva voce/ OSPE			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
MI8.14	Demonstrate confidentiality pertaining to patient identity in laboratory results	A	SH	Y	DOAP session	Skill assessment		AETCOM	
MI8.15	Choose and Interpret the results of the laboratory tests used in diagnosis of the infectious diseas	K/S	SH	Y	Small group discussion, Case discussion	Written/ Viva voce/ OSPE			
MI8.16	Describe the National Health Programs in the prevention of common infectious disease (for information purpose only as taught in CM)	K	K	Y	Lecture	Written/ Viva voce			Community Medicine
	*causative agents of Infectious diseases are inclusive of bacterial, viral, parasites and fungal agents causing various clinical conditions.								
	Column C: K- Knowledge, S – Skill, A - Attitude / professionalism, C- Communication. **Column D: K – Knows, KH - Knows How, SH - Shows how, P- performs independently,** **Column F: DOAP session – Demonstrate, Observe, Assess, Perform.** **Column H: If entry is P: indicate how many procedures must be done independently for certification/ graduation**								
Integration									
	Biochemistry								
BI10.5	Describe antigens and concepts involved in vaccine development.	K	KH	Y	Lectures, Small group discussion	Written/ Viva voce		Pathology, Pediatrics, Microbiology	
	Pathology								
PA7.5	Describe the immunology and the immune response to cancer	K	KH	N	Lecture, Small group discussion	Written/ Viva voce			Microbiology
PA9.1	Describe the principles and mechanisms involved in immunity	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	Microbiology
PA9.2	Describe the mechanism of hypersensitivity reactions	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Microbiology

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
PA9.3	Describe the HLA system and the immune principles involved in transplant and mechanism of transplant rejection	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Microbiology
PA9.6	Define and describe the pathogenesis and pathology of HIV and AIDS	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
PA10.1	Define and describe the pathogenesis and pathology of malaria	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
PA10.2	Define and describe the pathogenesis and pathology of cysticercosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
PA10.3	Define and describe the pathogenesis and pathology of leprosy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
PA10.4	Define and describe the pathogenesis and pathology of common bacterial, viral, protozoal and helminthic diseases	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
PA22.5	Enumerate and describe infections transmitted by blood transfusion	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Microbiology
PA26.1	Define and describe the etiology, types, pathogenesis, stages, morphology and complications of pneumonia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
PA26.2	Describe the etiology, gross and microscopic appearance and complications of lung abscess	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
PA26.3	Define and describe the etiology, types, pathogenesis, stages, morphology and complications and evaluation of Obstructive Airway Disease (OAD) and bronchiectasis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, General Medicine	Microbiology
PA26.4	Define and describe the etiology, types, pathogenesis, stages, morphology, microscopic appearance and complications of tuberculosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
PA27.4	Describe the etiology, pathophysiology, pathology, gross and microscopic features, criteria and complications of rheumatic fever	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
PA27.6	Describe the etiology, pathophysiology, pathology, gross and microscopic, features diagnosis and complications of infective endocarditis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
PA27.10	Describe the etiology, pathophysiology, pathology features and complications of syphilis on the cardiovascular system	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
PA33.1	Classify and describe the etiology, pathogenesis, manifestations, radiologic and morphologic features and complications of osteomyelitis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy, Orthopaedics	Microbiology
PA35.1	Describe the etiology, types and pathogenesis, differentiating factors, CSF findings in meningitis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
PA35.3	Identify the etiology of meningitis based on given CSF parameters	S	P	Y	DOAP session	Skill Assessment	1	General Medicine	Microbiology
Pharmacology									
PH1.43	Describe and discuss the rational use of antimicrobials including antibiotic stewardship program	K	KH	Y	Lecture	Written/ Viva voce		General Medicine Pediatrics	Microbiology
PH1.45	Describe the dugs used in MDR and XDR Tuberculosis	K	KH	Y	Lecture	Written/ Viva voce		Respiratory Medicine	Microbiology
PH1.46	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of antileprotic drugs	K	KH	Y	Lecture	Written/ Viva voce		Dermatology, Venereology & Leprosy	Microbiology
PH1.47	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of the drugs used in malaria, KALA-AZAR, amebiasis and intestinal helminthiasis	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Microbiology

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
PH1.48	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of the drugs used in UTI/ STD and viral diseases including HIV	K	KH	Y	Lecture	Written/Viva voce			Microbiology
Community Medicine									
CM3.3	Describe the aetiology and basis of water borne diseases/ jaundice/hepatitis/ diarrheal diseases	K	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce		Microbiology, General Medicine, Pediatrics	
CM3.6	Describe the role of vectors in the causation of diseases. Also discuss National Vector Borne disease Control Program	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology	
CM3.7	Identify and describe the identifying features and life cycles of vectors of Public Health importance and their control measures	S	SH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce/ Skill assessment		Microbiology	
CM5.7	Describe food hygiene	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Microbiology
CM7.7	Describe and demonstrate the steps in the Investigation of an epidemic of communicable disease and describe the principles of control measures	S	SH	Y	Small group discussion, DOAP sessions	Written/ Skill assessment		General Medicine	Microbiology
CM8.1	Describe and discuss the epidemiological and control measures including the use of essential laboratory tests at the primary care level for communicable diseases	K	KH	Y	Small group discussion, Lecture	Written/ Viva voce		General Medicine, Pediatrics	Microbiology, Pathology
CM14.1	Define and classify hospital waste	K	KH	Y	Lecture, Small group discussion, visit to hospital	Written/ Viva voce			Microbiology
CM14.2	Describe various methods of treatment of hospital waste	K	KH	Y	Lecture, Small group discussion, visit to hospital	Written/ Viva voce			Microbiology

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
CM14.3	Describe laws related to hospital waste management	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Microbiology
Dermatology, Venereology & Leprosy									
DR6.1	Describe the etiology pathogenesis and diagnostic features of pediculosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	Microbiology
DR7.1	Describe the etiology microbiology pathogenesis and clinical presentations and diagnostic features of dermatophytes	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	Microbiology
DR7.2	Identify candida species in fungal scrapings and KOH mount	S	SH	Y	DOAP session	Skill assessment			Microbiology
DR7.3	Describe the pharmacology and action of antifungal (systemic and topical) agents. Enumerate side effects of antifungal therapy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Microbiology ,Pharmacology
DR8.1	Describe the etiology microbiology pathogenesis and clinical presentations and diagnostic features of common viral infections of the skin	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	Microbiology
DR9.1	Classify, describe the epidemiology, etiology, microbiology, pathogenesis and clinical presentations and diagnostic features of Leprosy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology, Community Medicine
DR10.1	Identify and classify syphilis based on the presentation and clinical manifestations	S	SH	Y	Bedside clinic	Skill assessment		General Medicine	Microbiology
DR10.2	Identify spirochete in a dark ground microscopy	S	SH	Y	DOAP session	Skill assessment			Microbiology
DR10.3	Enumerate the indications and describe the pharmacology, administration and adverse reaction of pharmacotherapies for syphilis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Pharmacology, Microbiology

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
DR10.6	Describe the etiology, diagnostic and clinical features of non-syphilitic sexually transmitted diseases (chancroid, donovanosis and LGV)	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
DR10.7	Identify and differentiate based on the clinical features non-syphilitic sexually transmitted diseases (chancroid, donovanosis and LGV)	S	SH	Y	Bedside clinic	Skill assessment		General Medicine	Microbiology
DR10.8	Enumerate the indications and describe the pharmacology, indications and adverse reactions of drugs used in the non-syphilitic sexually transmitted diseases (chancroid, donovanosis and LGV)	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Pharmacology, Microbiology
DR11.1	Describe the etiology, pathogenesis and clinical features of the dermatologic manifestations of HIV and its complications including opportunistic infections	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
DR11.2	Identify and distinguish the dermatologic manifestations of HIV its complications, opportunistic infections and adverse reactions	S	SH	Y	Bedside clinic	Skill assessment		General Medicine	Microbiology
DR11.3	Enumerate the indications and describe the pharmacology, administration and adverse reaction of pharmacotherapies for dermatologic lesions in HIV	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		General Medicine	Pharmacology Microbiology
DR12.7	Identify and distinguish fixed drug eruptions and Steven Johnson syndrome from other skin lesions	S	SH	Y	Bedside clinic	Skill assessment		General Medicine	Pathology, Microbiology
DR14.1	Describe the etiology, pathogenesis and clinical precipitating features and classification of Urticaria and angioedema	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Microbiology, Pathology
DR15.2	Identify staphylococcus on a gram stain	S	SH	Y	Bedside clinic	Skill assessment			Microbiology
DR15.3	Enumerate the indications and describe the pharmacology, indications and adverse reactions of topical and systemic drugs used in treatment of pyoderma	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	Microbiology, Pharmacology

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
Dentistry									
DE1.2	Discuss the role of causative microorganisms in the aetio-pathogenesis of dental caries	K	KH	Y	Lecture, Small group discussion	Viva voce		Microbiology	
DE1.4	Discuss the role of dental caries as a focus of sepsis	K	KH	Y	Lecture, Small group discussion	Viva voce		Microbiology, General Medicine	
General Medicine									
IM1.3	Describe and discuss the aetiology, microbiology, pathogenies and clinical evolution of rheumatic fever, criteria, degree of rheumatic activity and rheumatic valvular heart disease and its complications including infective endocarditis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology, Microbiology	
IM1.9	Describe and discuss the clinical presentation and features, diagnosis, recognition and management of acute rheumatic fever	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology	
IM1.22	Assist and demonstrate the proper technique in collecting specimen for blood culture	S	SH	Y	DOAP session	Skill assessment		Microbiology	
IM1.27	Describe and discuss the role of penicillin prophylaxis in the prevention of rheumatic heart disease	K	KH	Y	Bedside clinic, Small group discussion	Written		Microbiology, Pharmacology	
IM3.1	Define, discuss, describe and distinguish community acquired pneumonia, nosocomial pneumonia and aspiration pneumonia	K	K	Y	Lecture, Small group discussion	short note/ Viva voce		Human Anatomy, Pathology, Microbiology	
IM3.2	Discuss and describe the aetiology of various kinds of pneumonia and their microbiology depending on the setting and immune status of the host	K	K	Y	Lecture, Small group discussion	short note/ Viva voce		Microbiology	
IM3.3	Discuss and describe the pathogenesis, presentation, natural history and complications of pneumonia	K	KH	Y	Lecture , Small group discussion	short note/ Viva voce		Pathology, Microbiology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
IM3.7	Order and interpret diagnostic tests based on the clinical presentation including: CBC, Chest X ray PA view, Mantoux, sputum gram stain, sputum culture and sensitivity, pleural fluid examination and culture, HIV testing and ABG	S	SH	Y	Bed side clinic, DOAP session	Skill assessment		Radiodiagnosis, Microbiology	
IM3.10	Demonstrate the correct technique in a mannequin and interpret results of a blood culture	S	SH	Y	DOAP session	Skill assessment		Microbiology	
IM3.11	Describe and enumerate the indications for further testing including HRCT, Viral cultures, PCR and specialised testing	S	SH	Y	Bed side clinic, DOAP session	Skill assessment		Radiodiagnosis, Microbiology	
IM3.12	Select, describe and prescribe based on the most likely aetiology, an appropriate empirical antimicrobial based on the pharmacology and antimicrobial spectrum	S	SH	Y	Bed side clinic, DOAP session	Skill Assessment/ Written/ Viva voce		Pharmacology, Microbiology	
IM3.13	Select, describe and prescribe based on culture and sensitivity appropriate empaling antimicrobial based on the pharmacology and antimicrobial spectrum.	S	SH	Y	Bed side clinic, DOAP session	Skill assessment/ Written/ Viva voce		Pharmacology, Microbiology	
IM3.14	Perform and interpret a sputum gram stain and AFB	S	P	Y	DOAP session	Skill assessment		Microbiology	
IM3.19	Discuss, describe and enumerate the indications and communicate to patients on pneumococcal and influenza vaccines	S/C	K	Y	Lecture, Small group discussion	Short note/ Viva voce		Microbiology	
IM4.1	Describe and discuss the febrile response and the influence of host immune status, risk factors and co-morbidities on the febrile response	K	K	Y	Lecture, Small group discussion	Written		Microbiology	
IM4.2	Describe and discuss the influence of special populations on the febrile response including: the elderly, immune suppression, malignancy and neutropenia, HIV and travel	K	K	Y	Lecture, Small group discussion	Written		Microbiology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
IM4.3	Discuss and describe the common causes, pathophysiology and manifestations of fever in various regions in India including bacterial, parasitic and viral causes (e.g. Dengue, Chikungunya, Typhus)	K	K	Y	Lecture, Small group discussion	Written		Microbiology, Community Medicine	
IM4.4	Describe and discuss the pathophysiology and manifestations of inflammatory causes of fever	K	KH	Y	Lecture, Small group discussion	Written		Microbiology	
IM4.5	Describe and discuss the pathophysiology and manifestations of malignant causes of fever including hematologic and lymph node malignancies	K	KH	Y	Lecture, Small group discussion	Written		Pathology, Microbiology	
IM4.6	Discuss and describe the pathophysiology and manifestations of malaria	K	KH	Y	Lecture, Small group discussion	Written		Microbiology	
IM4.8	Discuss and describe the pathophysiology, aetiology and clinical manifestations of fever of unknown origin (FUO) including in a normal host, neutropenic host, nosocomial host and a host with HIV disease	K	K	Y	Lecture, Small group discussion	Written		Microbiology	
IM4.9	Elicit document and present a medical history that helps delineate the aetiology of fever that includes the evolution and pattern of fever, associated symptoms, immune status, comorbidities, risk factors, exposure through occupation, travel and environment and medication use	S	SH	Y	Bed side clinic, DOAP session	Skill assessment		Microbiology	
IM4.12	Order and interpret diagnostic tests based on the differential diagnosis including: CBC with differential, peripheral smear, urinary analysis with sediment, Chest X ray, blood and urine cultures, sputum gram stain and cultures, sputum AFB and cultures, CSF analysis, pleural and body fluid analysis, stool routine and culture and QBC	K	SH	Y	Bedside clinic, Skill assessment	Skill assessment		Pathology, Microbiology	
IM4.13	Perform and interpret a sputum gram stain	S	SH	Y	DOAP session	Log book documentation		Microbiology	
IM4.14	Perform and interpret a sputum AFB	S	SH	Y	DOAP session	Log book documentation		Microbiology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
IM4.15	Perform and interpret a malarial smear	S	SH	Y	DOAP session	Log book documentation/ Skill assessment		Microbiology	
IM4.19	Assist in the collection of blood and wound cultures	S	SH	Y	DOAP session	Log book/ documentation		Microbiology	
IM4.20	Interpret a PPD (Mantoux)	S	SH	Y	DOAP session	Log book/ documentation		Microbiology	
IM4.23	Prescribe drugs for malaria based on the species identified, prevalence of drug resistance and national programs	S	SH	Y	Small group discussion	Skill assessment		Microbiology, Pharmacology	
IM4.26	Counsel the patient on malarial prevention	C	SH	Y	DOAP session	Skill assessment		Microbiology, Pharmacology	
IM5.4	Describe and discuss the epidemiology, microbiology, immunology and clinical evolution of infective (viral) hepatitis	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Microbiology	
IM5.14	Outline a diagnostic approach to liver disease based on hyperbilirubinemia, liver function changes and hepatitis serology	S	SH	Y	Bedside clinic,Small group discussion	Viva voce/ Written		Pathology, Microbiology	
IM5.17	Enumerate the indications precautions and counsel patients on vaccination for hepatitis	K/C	SH	Y	written Small group discussion	Written/ Viva voce		Microbiology	
IM6.1	Describe and discuss the symptoms and signs of acute HIV seroconversion	K	KH	Y	Lecture, Small group discussion	Short notes/ Viva voce		Microbiology	
IM6.2	Define and classify HIV AIDS based on the CDC criteria	K	KH	Y	Lecture, Small group discussion	Short notes/ Viva voce		Microbiology	
IM6.3	Describe and discuss the relationship between CDC count and the risk of opportunistic infections	K	KH	Y	Lecture, Small group discussion	Short notes/ Viva voce		Microbiology	
IM6.4	Describe and discuss the pathogenesis, evolution and clinical features of common HIV related opportunistic infections	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
IM6.10	Choose and interpret appropriate diagnostic tests to diagnose and classify the severity of HIV-AIDS including specific tests of HIV, CDC	K	KH	Y	Bedside clinic, DOAP session, Small group discussion	Written/ Skill assessment		Pathology, Microbiology	
IM6.13	Describe and enumerate the indications and side effects of drugs for bacterial, viral and other types of diarrhea	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology, Microbiology	
IM6.14	Perform and interpret a gram stain of the sputum	S	P	Y	DOAP session	Skill assessment		Microbiology	
IM6.17	Describe and discuss the principles of HAART, the classes of antiretroviral used, adverse reactions and interactions	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology, Pharmacology	
IM6.18	Describe and discuss the principles and regimens used in post exposure prophylaxis	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology, Pharmacology	
IM6.19	Enumerate the indications of and discuss about prophylactic drugs used to prevent HIV related opportunistic infections	K/C	K	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Microbiology	
IM13.3	Describe the relationship between infection and cancers	K	K	Y	Lecture, Small group discussion	Short notes/ Viva voce		Pathology, Microbiology	General Surgery
IM15.15	Describe and enumerate the indications, pharmacology and side effects of pharmacotherapy of acid peptic disease including Helicobacter pylori	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology, Microbiology	
IM16.1	Describe and discuss the aetiology of acute and chronic diarrhea including infectious and non-infectious causes	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology	
IM6.13	Describe and enumerate the indications, pharmacology and side effects of pharmacotherapy for bacterial, viral and other types of diarrhea	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology, Microbiology	
IM16.8	Choose and interpret diagnostic tests based on the clinical diagnosis including complete blood count, and stool examination	S	SH	Y	Bedside clinic, Skills lab, Small group discussion	Skill assessment/ Short note/ Viva voce		Microbiology, Pathology	
IM16.9	Identify common parasitic causes of diarrhea under the microscope in a stool specimen	S	SH	Y	DOAP session	Skill assessment		Microbiology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
IM16.10	Identify Vibrio cholera in a hanging drop specimen	S	SH	Y	DOAP session	Skill Assessment		Microbiology	
IM16.11	Enumerate the indications for stool cultures and blood cultures in patients with acute diarrhea	K	KH	Y	Lectures, Small group discussion	Written/ Viva voce		Microbiology	
IM16.13	Describe and enumerate the indications, pharmacology and side effects of pharmacotherapy for parasitic causes of diarrhea	K	K	Y	Lectures, Small group discussion	Written/ Viva voce		Pharmacology, Microbiology	
IM17.7	Enumerate the indications and describe the findings in the CSF in patients with meningitis	K	K	Y	Small group discussion, Bedside clinic	Skill Assessment		Microbiology, Pathology	
IM17.8	Demonstrate in a mannequin or equivalent the correct technique for performing a lumbar puncture	S	SH	Y	DOAP session	Skill assessment		Microbiology, Pathology	
IM17.9	Interpret the CSF findings when presented with various parameters of CSF fluid analysis	S	SH	Y	Small group discussion, Bedside clinic	Skill assessment		Microbiology, Pathology	
IM25.1	Describe and discuss the response and the influence of host immune status, risk factors and comorbidities on zoonotic disease (eg. Leptospirosis, Rabies) and non febrile infectious disease (eg. Tetanus)	K	K	Y	Lecture, Small group discussion	Written		Microbiology, Community Medicine	
IM25.2	Describe and discuss the common causes pathophysiology and manifestations of these diseases	K	K	Y	Lecture, Small group discussion	Written		Microbiology, Community Medicine	
IM25.3	Describe and discuss the pathophysiology and manifestations of these diseases	K	KH	Y	Lecture, Small group discussion	Written		Microbiology	
IM25.9	Assist in the collection of blood and other specimen cultures	S	SH	Y	DOAP session	Log book documentation		Microbiology	
IM25.11	Develop an appropriate empiric treatment plan based on the patient’s clinical and immune status pending definitive diagnosis	C	SH	Y	DOAP session	Skill assessment		Microbiology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
Pediatrics									
PE19.1	Explain the components of the Universal immunization Program and the sub National Immunization Programs	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine, Microbiology	
PE19.2	Explain the epidemiology of Vaccine preventable diseases	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine, Microbiology	
PE19.3	Vaccine description with regard to classification of vaccines, strain used, dose, route, schedule, risks, benefits and side effects, indications and contraindications	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine, Microbiology	
PE19.4	Define cold chain and discuss the methods of safe storage and handling of vaccines	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine, Microbiology	
PE19.5	Discuss immunization in special situations – HIV positive children, immunodeficiency, preterm, organ transplants, those who received blood and blood products, splenectomised children, adolescents, travellers	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine, Microbiology	
PE21.1	Enumerate the etio-pathogenesis clinical features, complications and management of Urinary Tract infection in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology	
PE23.6	Discuss the etio-pathogenesis and clinical features and management of Infective endocarditis in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Pathology, Microbiology	
PE24.1	Discuss the etio-pathogenesis, classification, clinical presentation and management of diarrheal diseases in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Microbiology	
PE24.2	Discuss the classification and clinical presentation of various types of diarrheal dehydration	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Microbiology	
PE24.5	Discuss the role of antibiotics, antispasmodics, anti-secretory drugs, probiotics, anti- emetics in acute diarrheal diseases	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology, Microbiology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
PE24.6	Discuss the causes, clinical presentation and management of persistent diarrhoea in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology	
PE24.8	Discuss the causes, clinical presentation and management of dysentery in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology, Microbiology	
PE24.12	Perform and interpret stool examination including Hanging Drop	S	P	N	Bed side clinics, Skills lab	log book	2	Microbiology	
PE26.1	Discuss the etio-pathogenesis, clinical features and management of acute hepatitis in children	K	KH	Y	Lecture, Small group activity	Written/ Viva voce		Pathology, Microbiology	
PE26.2	Discuss the etio-pathogenesis, clinical features and management of Fulminant Hepatic Failure in children	K	KH	Y	Lecture, Small group activity	Written/ Viva voce		Pathology, Microbiology	
PE26.3	Discuss the etio-pathogenesis, clinical features and management of chronic liver diseases in children	K	KH	Y	Lecture, Small group activity	Written/ Viva voce		Pathology, Microbiology	
PE26.12	Discuss the prevention of Hep B infection – Universal precautions and Immunisation	K	KH	Y	Lecture, Small group discussion activity	Written/ Viva voce		Microbiology	
PE30.1	Discuss the etio-pathogenesis, clinical features, complications, management and prevention of meningitis in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology	
PE30.2	Distinguish bacterial, viral and tuberculous meningitis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology	
PE30.13	Discuss the etio-pathogenesis, clinical features, management and prevention of Poliomyelitis in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology	
PE30.21	Interpret and explain the findings in a CSF analysis	S	SH	Y	Small group discussion	Log book		Microbiology	Respiratory Medicine
PE34.1	Discuss the epidemiology, clinical features, clinical types, complications of Tuberculosis in Children and Adolescents	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology	Respiratory Medicine

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
PE34.2	Discuss the various diagnostic tools for childhood tuberculosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology	Respiratory Medicine
PE34.3	Discuss the various regimens for management of Tuberculosis as per National Guidelines	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology, Community Medicine Pharmacology	Respiratory Medicine
PE34.4	Discuss the preventive strategies adopted and the objectives and outcome of the National Tuberculosis Control Program	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology, Community Medicine Pharmacology	Respiratory Medicine
PE34.6	Identify a BCG scar	S	P	Y	Bed side clinics, Skills lab	Skill Assessment	3	Microbiology	Respiratory Medicine
PE34.7	Interpret a Mantoux test	S	P	Y	Bed side clinics Skills lab	Skill assessment	3	Microbiology	Respiratory Medicine
PE34.9	Interpret blood tests in the context of laboratory evidence for tuberculosis	S	SH	N	Bed side clinics, Small group discussion	Log book		Microbiology	Respiratory Medicine
PE34.10	Discuss the various samples for demonstrating the organism eg Gastric Aspirate, Sputum, CSF, FNAC	K	KH	Y	Bed side clinics, Small group discussion	Written/ Viva voce		Microbiology	Respiratory Medicine
PE34.11	Perform AFB staining	S	P	Y	DOAP session	Log book/journal	3	Microbiology	Respiratory Medicine
PE34.12	Enumerate the indications and Discuss the limitation of methods of culturing M.Tuberculii	K	KH	Y	Small group discussion	Written/ Viva voce		Microbiology	
General Surgery									
SU6.1	Define and describe the aetiology and pathogenesis of surgical infections	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
SU9.1	Choose appropriate biochemical, microbiological, pathological, imaging investigations and interpret the investigative data in a surgical patient	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, Microbiology, Pathology	
SU13.1	Describe the immunological basis of organ transplantation	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology	
SU13.2	Discuss the Principles of immunosuppressive therapy.Enumerate Indications, describe surgical principles, management of organ transplantation	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology, Pharmacology	
SU14.1	Describe aseptic techniques, sterilization and disinfection	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology	
SU15.1	Describe Classification of hospital waste and appropriate methods of disposal	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology	
SU29.3	Describe the Clinical features, Investigations and principles of management of urinary tract infections	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology	
Orthopaedics									
OR3.1	Describe and discuss the aetiopathogenesis, clinical features, Investigations and principles of management of Bone and Joint infections a) Acute Osteomyelitis b) Subacute osteomyelitis c) Acute Suppurative arthritis d) Septic arthritis & HIV infection e) Spirochaetal infection f) Skeletal Tuberculosis	K/S	K/KH/SH	Y	Lecture, Small group discussion, Video assisted lecture	Written/ Viva voce/ OSCE		Pathology, Microbiology	
Respiratory Medicine									

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
CT1.2	Describe and discuss the microbiology of tubercle bacillus, mode of transmission, pathogenesis, clinical evolution and natural history of pulmonary and extra pulmonary forms (including lymph node, bone and CNS).	K	KH	Y	Lecture, Small group discussion	Written		Microbiology	
CT1.3	Discuss and describe the impact of confection with HIV and other co-morbid conditions like diabetes on the natural history of tuberculosis	K	K	Y	Lecture, Small group discussion	Written		Microbiology	
CT1.4	Describe the epidemiology, the predisposing factors and microbial and therapeutic factors that determine resistance to drugs	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine, Microbiology, Pharmacology	
CT1.7	Perform and interpret a PPD (Mantoux) and describe and discuss the indications and pitfalls of the test	S	P	Y	DOAP session	Maintenance of log book		Microbiology	
CT1.10	Perform and interpret an AFB stain	S	P	Y	DOAP session	Skill assessment	1	Microbiology	
CT1.12	Enumerate the indications for tests including: serology, special cultures and polymerase chain reaction and sensitivity testing	K	KH	Y	Small group discussion, Lecture	Short note/ Viva voce		Microbiology	
CT1.13	Describe and discuss the origins, indications, technique of administration, efficacy and complications of the BCG vaccine	K	KH	Y	Lecture, Small group discussion	Short note/ Viva voce		Microbiology	

FORENSIC MEDICINE INCLUDING TOXICOLOGY (CODE: FM)

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
FORENSIC MEDICINE & TOXICOLOGY									
Topic: General Information		**Number of competencies: (11)**				**Number of procedures that require certification: (NIL)**			
FM1.1	Demonstrate knowledge of basics of Forensic Medicine like definitions of Forensic medicine, Clinical Forensic Medicine, Forensic Pathology, State Medicine, Legal Medicine and Medical Jurisprudence	K	KH	N	Lecture, Small Group Discussion	Written/ Viva voce			
FM1.2	Describe history of Forensic Medicine	K	KH	N	Lecture, Small Group Discussion	Written/ Viva voce			
FM1.3	Describe legal procedures including Criminal Procedure Code, Indian Penal Code, Indian Evidence Act, Civil and Criminal Cases, Inquest (Police Inquest and Magistrate's Inquest), Cognizable and Non-cognizable offences	K	KH	N	Lecture, Small Group Discussion	Written/ Viva voce			
FM1.4	Describe Courts in India and their powers: Supreme Court, High Court, Sessions court, Magistrate's Court, Labour Court, Family Court, Executive Magistrate Court and Juvenile Justice Board	K	KH	N	Lecture, Small Group Discussion	Written/ Viva voce			
FM1.5	Describe Court procedures including issue of Summons, conduct money, types of witnesses, recording of evidence oath, affirmation, examination in chief, cross examination, re-examination and court questions, recording of evidence & conduct of doctor in witness box	K	KH	N	Lecture, Small Group Discussion, Moot Court	Written/ Viva voce			
FM1.6	Describe Offenses in Court including Perjury; Court strictures vis-a-vis Medical Officer	K	KH	N	Lecture, Small Group Discussion	Written/ Viva voce			
FM1.7	Describe Dying Declaration & Dying Deposition	K	KH	Y	Lecture, Small Group Discussion	Written/ Viva voce			
FM1.8	Describe the latest decisions/notifications/resolutions/ circulars/standing orders related to medico-legal practice issued by Courts/Government authorities etc.	K	KH	Y	Lecture, Small Group Discussion	Written/ Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
FM1.9	Describe the importance of documentation in medical practice in regard to medicolegal examinations, Medical Certificates and medicolegal reports especially - maintenance of patient case records, discharge summary, prescribed registers to be maintained in Health Centres. - maintenance of medico-legal register like accident register. - documents of issuance of wound certificate - documents of issuance of drunkenness certificate. - documents of issuance of sickness and fitness certificate. - documents for issuance of death certificate. -documents of Medical Certification of Cause of Death - Form Number4 and 4A - documents for estimation of age by physical, dental and radiological examination and issuance of certificate	K	KH	Y	Lecture, Small Group Discussion	Written/ Viva voce		Radiodiagnosis, General Surgery, General Medicine, Pediatrics	
FM1.10	Select appropriate cause of death in a particular scenario by referring ICD 10 code	K	KH	Y	Lecture, Small Group Discussion	Written/ Viva voce			
FM1.11	Write a correct cause of death certificate as per ICD 10 document	S	SH	Y	Lecture, Small Group Discussion	Written/ Viva voce			
Topic: Forensic Pathology		**Number of competencies: (35)**				**Number of procedures that require certification : (NIL)**			
FM2.1	Define, describe and discuss death and its types including somatic/clinical/cellular, molecular and brain-death, Cortical Death and Brainstem Death	K	KH	Y	Lecture/Small group discussion	Written/ Viva voce		Pathology	
FM2.2	Describe and discuss natural and unnatural deaths	K	KH	Y	Lecture, Small Group Discussion	Written/ Viva voce		Pathology	
FM2.3	Describe and discuss issues related to sudden natural deaths	K	KH	Y	Lecture, Small Group Discussion	Written/ Viva voce		Pathology	
FM2.4	Describe salient features of the Organ Transplantation and The Human Organ Transplant (Amendment) Act 2011 and discuss ethical issues regarding organ donation	K	KH	Y	Lecture/Small group discussion	Written/ Viva voce		AETCOM	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
FM2.5	Discuss moment of death, modes of death - coma, asphyxia and syncope	K	KH	Y	Lecture, Small Group Discussion	Written/ Viva voce		Psychiatry, Pathology	
FM2.6	Discuss presumption of death and survivorship	K	KH	Y	Lecture, Small Group Discussion	Written/ Viva voce			
FM2.7	Describe and discuss suspended animation	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
FM2.8	Describe and discuss postmortem changes including signs of death, cooling of body, post-mortem lividity, rigor mortis, cadaveric spasm, cold stiffening and heat stiffening	K	KH	Y	Lecture, Small group discussion, Autopsy, DOAP session	Written/ Viva voce/ OSPE			
FM2.9	Describe putrefaction, mummification, adipocere and maceration	K	KH	Y	Lecture, Small group discussion, Autopsy, DOAP session	Written/ Viva voce/ OSPE			
FM2.10	Discuss estimation of time since death	K	KH	Y	Lecture, Small group discussion, Autopsy, DOAP session	Written/ Viva voce/ OSPE			
FM2.11	Describe and discuss autopsy procedures including post-mortem examination, different types of autopsies, aims and objectives of post-mortem examination	K	KH	Y	Lecture, Small group discussion, Autopsy, DOAP session	Written/ Viva voce/ OSPE		Pathology	
FM2.12	Describe the legal requirements to conduct post-mortem examination and procedures to conduct medico-legal post-mortem examination	K	KH	Y	Lecture, Small group discussion, Autopsy, DOAP session	Written/ Viva voce/ OSPE		Pathology	
FM2.13	Describe and discuss obscure autopsy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
FM2.14	Describe and discuss examination of clothing, preservation of viscera on post-mortem examination for chemical analysis and other medico-legal purposes, post-mortem artefacts	K	KH	Y	Lecture, Small group discussion, Autopsy, DOAP session	Written/ Viva voce/ OSPE			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
FM 2.15	Describe special protocols for conduction of medico-legal autopsies in cases of death in custody or following violation of human rights as per National Human Rights Commission Guidelines	K	KH	Y	Lecture, Small group discussion, Autopsy, DOAP session	Written/ Viva voce/ OSPE			
FM2.16	Describe and discuss examination of mutilated bodies or fragments, charred bones and bundle of bones	K	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce/ OSPE			
FM2.17	Describe and discuss exhumation	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
FM2.18	Crime Scene Investigation:- Describe and discuss the objectives of crime scene visit, the duties & responsibilities of doctors on crime scene and the reconstruction of sequence of events after crime scene investigation	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
FM2.19	Investigation of anaesthetic, operative deaths: Describe and discuss special protocols for conduction of autopsy and for collection, preservation and dispatch of related material evidences	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Anesthesiology, General Surgery	
FM2.20	Mechanical asphyxia: Define, classify and describe asphyxia and medico-legal interpretation of post-mortem findings in asphyxial deaths	K	KH	Y	Lecture, Small group discussion, Autopsy, DOAP session	Written/ Viva voce/ OSPE			
FM2.21	Mechanical asphyxia: Describe and discuss different types of hanging and strangulation including clinical findings, causes of death, post-mortem findings and medico-legal aspects of death due to hanging and strangulation including examination, preservation and dispatch of ligature material	K	KH	Y	Lecture/Small group discussion, Autopsy DOAP session	Written/ Viva voce/ OSPE			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
FM2.22	Mechanical asphyxia: Describe and discuss patho-physiology, clinical features, post-mortem findings and medico-legal aspects of traumatic asphyxia, obstruction of nose & mouth, suffocation and sexual asphyxia	K	KH	Y	Lecture, Small group discussion, Autopsy, DOAP session	Written/ Viva voce/ OSPE			
FM2.23	Describe and discuss types, patho-physiology, clinical features, post-mortem findings and medico-legal aspects of drowning, diatom test and, gettler test.	K	KH	Y	Lecture, Small group discussion, Autopsy, DOAP session	Written/ Viva voce/ OSPE			
FM2.24	Thermal deaths: Describe the clinical features, post-mortem finding and medicolegal aspects of injuries due to physical agents like heat (heat-hyper-pyrexia, heat stroke, sun stroke, heat exhaustion/prostration, heat cramps [miner's cramp] or cold (systemic and localized hypothermia, frostbite, trench foot, immersion foot)	K	KH	Y	Lecture, Small group discussion, Autopsy, DOAP session	Written/ Viva voce			
FM2.25	Describe types of injuries, clinical features, patho-physiology, post-mortem findings and medico-legal aspects in cases of burns, scalds, lightening, electrocution and radiations	K	KH	Y	Lecture, Small group discussion, Autopsy, DOAP session	Written/ Viva voce/ OSPE		General Surgery	
FM2.26	Describe and discuss clinical features, post-mortem findings and medico-legal aspects of death due to starvation and neglect	K	KH	Y	Lecture/Small group discussion	Written/ Viva voce			
FM2.27	Define and discuss infanticide, foeticide and stillbirth	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	
FM2.28	Describe and discuss signs of intrauterine death, signs of live birth, viability of foetus, age determination of foetus, DOAP session of ossification centres, Hydrostatic test, Sudden Infants Death syndrome and Munchausen's syndrome by proxy	K	KH	Y	Lecture, Small group discussion, Autopsy, DOAP session	Written/Viva voce / OSCE		Pediatrics, Human Anatomy	
FM2.29	Demonstrate respect to the directions of courts, while appearing as witness for recording of evidence under oath or affirmation, examination in chief, cross examination, re-examination and court questions, recording of evidence	A and C	SH	Y	Lecture, Small group discussion, Moot Court, Court visits, Role Play	Role Play during internal assessment			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
FM2.30	Have knowledge/awareness of latest decisions/notifications/ resolutions/circulars/standing orders related to medico-legal practice issued by Courts/Government authorities etc	A	K	Y	Lecture/Small group discussion	Written/ Viva voce			
FM2.31	Demonstrate ability to work in a team for conduction of medico-legal autopsies in cases of death following alleged negligence medical dowry death, death in custody or following violation of human rights as per National Human Rights Commission Guidelines on exhumation	A	KH	Y	Lecture, Small group discussion, Autopsy, DOAP session	Written/ Viva voce/ OSPE			
FM2.32	Demonstrate ability to exchange information by verbal, or nonverbal communication to the peers, family members, law enforcing agency and judiciary	A and C	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce		AETCOM	
FM2.33	Demonstrate ability to use local resources whenever required like in mass disaster situations	A and C	KH	Y	Lecture/Small group discussion	Written/ Viva voce		Community Medicine	
FM2.34	Demonstrate ability to use local resources whenever required like in mass disaster situations	A and C	KH	Y	Lecture/Small group discussion	Written/ Viva voce		General Medicine, AETCOM	
FM2.35	Demonstrate professionalism while conducting autopsy in medicolegal situations, interpretation of findings and making inference/opinion, collection preservation and dispatch of biological or trace evidences	A and C	KH/SH		Lecture, small group discussions, DOAP session	Written/ Viva voce/ OSPE		AETCOM	
Topic: Clinical Forensic Medicine		**Number of competencies:(33)**				**Number of procedures that require certification:(NIL)**			
FM3.1	IDENTIFICATION Define and describe Corpus Delicti, establishment of identity of living persons including race, Sex, religion, complexion, stature, age determination using morphology, teeth-eruption, decay, bite marks, bones-ossification centres, medico-legal aspects of age	K	KH	Y	Lecture, Small group discussion, Bedside clinic, DOAP session	Written/Viva voce/ skill assessment		Human Anatomy	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
FM3.2	IDENTIFICATION Describe and discuss identification of criminals, unknown persons, dead bodies from the remains-hairs, fibers, teeth, anthropometry, dactylography, foot prints, scars, tattoos, poroscopy and superimposition	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
FM3.3	Mechanical injuries and wounds: Define, describe and classify different types of mechanical injuries, abrasion, bruise, laceration, stab wound, incised wound, chop wound, defense wound, self-inflicted/fabricated wounds and their medico-legal aspects	K	KH	Y	Lecture, Small group discussion Bed side clinic, DOAP session	Written/ Viva voce/ OSCE		General Surgery	
FM3.4	Mechanical injuries and wounds: Define injury, assault & hurt. Describe IPC pertaining to injuries	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
FM3.5	Mechanical injuries and wounds: Describe accidental, suicidal and homicidal injuries. Describe simple, grievous and dangerous injuries. Describe ante-mortem and post-mortem injuries	K	K/KH	Y	Lecture/Small group discussion	Written/ Viva voce			
FM3.6	Mechanical injuries and wounds: Describe healing of injury and fracture of bones with its medico-legal importance	K	K/KH	Y	Lecture/Small group discussion	Written/ Viva voce		General Surgery	
FM3.7	Describe factors influencing infliction of injuries and healing, examination and certification of wounds and wound as a cause of death: Primary and Secondary	K	K/KH	Y	Lecture/Small group discussion	Written/ Viva voce		General Surgery, Orthopaedics	
FM3.8	Mechanical injuries and wounds: Describe and discuss different types of weapons including dangerous weapons and their examination	K	K/KH	Y	Lecture/Small group discussion	Written/ Viva voce		General Surgery, Orthopaedics	
FM3.9	Firearm injuries: Describe different types of firearms including structure and components. Along with description of ammunition propellant charge and mechanism of fire-arms, different types of cartridges and bullets and various terminology in relation of firearm – caliber, range, choking	K	K/KH	Y	Lecture/Small group discussion	Written/ Viva voce		General Surgery, Orthopaedics	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
FM3.10	Firearm injuries: Describe and discuss wound ballistics-different types of firearm injuries, blast injuries and their interpretation, preservation and dispatch of trace evidences in cases of firearm and blast injuries, various tests related to confirmation of use of firearms	K	K/KH	Y	Lecture, Small group discussion, Bed side clinic, DOAP session	Written/Viva voce/ OSCE		General Surgery, Orthopaedics	
FM3.11	Regional Injuries: Describe and discuss regional injuries to head (Scalp wounds, fracture skull, intracranial haemorrhages, coup and contrecoup injuries), neck, chest, abdomen, limbs, genital organs, spinal cord and skeleton	K	K/KH	Y	Lecture, Small group discussion, Bed side clinic or autopsy, DOAP session	Written/ Viva voce/ OSCE/OSPE		General Surgery, Orthopaedics	
FM3.12	Regional Injuries Describe and discuss injuries related to fall from height and vehicular injuries – Primary and Secondary impact, Secondary injuries, crush syndrome, railway spine	K	K/KH	Y	Lecture, Small group discussion, Bed side clinic or autopsy, DOAP session	Written/ Viva voce/ OSCE/OSPE		General Surgery, Orthopaedics	
FM3.13	Describe different types of sexual offences. Describe various sections of IPC regarding rape including definition of rape (Section 375 IPC), Punishment for Rape (Section 376 IPC) and recent amendments notified till date	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce/ OSCE/OSPE		Obstetrics & Gynaecology	
FM3.14	SEXUAL OFFENCES Describe and discuss the examination of the victim of an alleged case of rape, and the preparation of report, framing the opinion and preservation and despatch of trace evidences in such cases	K	K/KH	Y	Lecture, Small group discussion, Bed side clinic, DOAP session	Written/ Viva voce/ OSCE		Obstetrics & Gynaecology, Psychiatry	
FM3.15	SEXUAL OFFENCES Describe and discuss examination of accused and victim of sodomy, preparation of report, framing of opinion, preservation and despatch of trace evidences in such cases	K	K/KH	Y	Lecture, Small group discussion, Bed side clinic, DOAP session	Written/ Viva voce/ OSCE		Obstetrics & Gynaecology, Psychiatry	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
FM3.16	SEXUAL OFFENCES Describe and discuss adultery and unnatural sexual offences- sodomy, incest, lesbianism, buccal coitus, bestiality, indecent assault and preparation of report, framing the opinion and preservation and despatch of trace evidences in such cases	K	K/KH	Y	Lecture/Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology, Psychiatry	
FM3.17	Describe and discuss the sexual perversions fetishism, transvestism, voyeurism, sadism, necrophagia, masochism, exhibitionism, frotteurism, Necrophilia	K	K/KH	Y	Lecture/Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology, Psychiatry	
FM3.18	Describe anatomy of male and female genitalia, hymen and its types. Discuss the medico-legal importance of hymen. Define virginity, defloration, legitimacy and its medicolegal importance	K	K/KH	Y	Lecture/Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology	
FM3.19	Discuss the medicolegal aspects of pregnancy and delivery, signs of pregnancy, precipitate labour superfoetation, superfecundation and signs of recent and remote delivery in living and dead	K	K/KH	Y	Lecture/Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology	
FM3.20	Discuss disputed paternity and maternity	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology	
FM3.21	Discuss Pre-conception and Pre Natal Diagnostic Techniques (PC&PNDT) - Prohibition of Sex Selection Act 2003 and Domestic Violence Act 2005	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology, AETCOM	
FM3.22	Define and discuss impotence, sterility, frigidity, sexual dysfunction, premature ejaculation. Discuss the causes of impotence and sterility in male and female	K	K/KH	Y	Lecture/Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology, General Medicine	
FM3.23	Discuss Sterilization of male and female, artificial insemination, Test Tube Baby, surrogate mother, hormonal replacement therapy with respect to appropriate national and state laws	K	K/KH	Y	Lecture/Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
FM3.24	Discuss the relative importance of surgical methods of contraception (vasectomy and tubectomy) as methods of contraception in the National Family Planning Programme	K	K/KH	N	Lecture, Small group discussion	Written		Obstetrics & Gynaecology	
FM3.25	Discuss the major results of the National Family Health Survey	K	K/KH	N	Lecture	Written		Obstetrics & Gynaecology	
FM3.26	Discuss the national Guidelines for accreditation, supervision & regulation of ART Clinics in India	K	K/KH	Y	Lecture, Small group discussion	Written		Obstetrics & Gynaecology	
FM3.27	Define, classify and discuss abortion, methods of procuring MTP and criminal abortion and complication of abortion. MTP Act 1971	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology, AETCOM	
FM3.28	Describe evidences of abortion - living and dead, duties of doctor in cases of abortion, investigations of death due to criminal abortion	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology, Pathology	
FM3.29	Describe and discuss child abuse and battered baby syndrome	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	
FM3.30	Describe and discuss issues relating to torture, identification of injuries caused by torture and its sequalae, management of torture survivors	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce			
FM3.31	Torture and Human rights Describe and discuss guidelines and Protocols of National Human Rights Commission regarding torture	K	K/KH	N	Lecture/Small group discussion	Written/ Viva voce			
FM3.32	Demonstrate the professionalism while preparing reports in medicolegal situations, interpretation of findings and making inference/opinion, collection preservation and dispatch of biological or trace evidences	A and C	SH	Y	Lecture, Small group discussion	OSPE/Viva voce		AETCOM	
FM3.33	Should be able to demonstrate the professionalism while dealing with victims of torture and human right violations, sexual assaults-psychological consultation, rehabilitation	A and C	K/KH/SH	Y	Lecture/Small group discussion	Written/ Viva voce		AETCOM	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
Topic: Medical Jurisprudence (Medical Law and ethics)		**Number of competencies: (30)**				**Number of procedures that require certification : (NIL)**			
FM4.1	Describe Medical Ethics and explain its historical emergence	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM	
FM4.2	Describe the Code of Medical Ethics 2002 conduct, Etiquette and Ethics in medical practice and unethical practices & the dichotomy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM	
FM4.3	Describe the functions and role of Medical Council of India and State Medical Councils	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM	
FM4.4	Describe the Indian Medical Register	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM	
FM4.5	Rights/privileges of a medical practitioner, penal erasure, infamous conduct, disciplinary Committee, disciplinary procedures, warning notice and penal erasure	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM	
FM4.6	Describe the Laws in Relation to medical practice and the duties of a medical practitioner towards patients and society	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM	
FM4.7	Describe and discuss the ethics related to HIV patients	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM	
FM4.8	Describe the Consumer Protection Act-1986 (Medical Indemnity Insurance, Civil Litigations and Compensations), Workman's Compensation Act & ESI Act	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM	
FM4.9	Describe the medico - legal issues in relation to family violence, violation of human rights, NHRC and doctors	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		AETCOM	
FM4.10	Describe communication between doctors, public and media	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM	
FM4.11	Describe and discuss euthanasia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM, Pharmacology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
FM4.12	Discuss legal and ethical issues in relation to stem cell research	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM, Pharmacology	
FM4.13	Describe social aspects of Medico-legal cases with respect to victims of assault, rape, attempted suicide, homicide, domestic violence, dowry- related cases	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM	
FM4.14	Describe & discuss the challenges in managing medico-legal cases including development of skills in relationship management – Human behaviour, communication skills, conflict resolution techniques	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM	
FM4.15	Describe the principles of handling pressure – definition, types, causes, sources and skills for managing the pressure while dealing with medico-legal cases by the doctor	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM	
FM4.16	Describe and discuss Bioethics	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM	
FM4.17	Describe and discuss ethical Principles: Respect for autonomy, non-malfeasance, beneficence & justice	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM, Pharmacology	
FM4.18	Describe and discuss medical negligence including civil and criminal negligence, contributory negligence, corporate negligence, vicarious liability, Res Ipsa Loquitor, prevention of medical negligence and defenses in medical negligence litigations	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM	
FM4.19	Define Consent. Describe different types of consent and ingredients of informed consent. Describe the rules of consent and importance of consent in relation to age, emergency situation, mental illness and alcohol intoxication	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM	
FM4.20	Describe therapeutic privilege, Malingering, Therapeutic Misadventure, Professional Secrecy, Human Experimentation	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
FM4.21	Describe Products liability and Medical Indemnity Insurance	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM	
FM4.22	Explain Oath – Hippocrates, Charaka and Sushruta and procedure for administration of Oath.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM, Pharmacology	
FM4.23	Describe the modified Declaration of Geneva and its relevance	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM, Pharmacology	
FM4.24	Enumerate rights, privileges and duties of a Registered Medical Practitioner. Discuss doctor- patient relationship: professional secrecy and privileged communication	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM	
FM4.25	Clinical research & Ethics Discuss human experimentation including clinical trials	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		AETCOM, Pharmacology	
FM4.26	Discuss the constitution and functions of ethical committees	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM, Pharmacology	
FM4.27	Describe and discuss Ethical Guidelines for Biomedical Research on Human Subjects & Animals	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		AETCOM, Pharmacology	
FM4.28	Demonstrate respect to laws relating to medical practice and Ethical code of conduct prescribed by Medical Council of India and rules and regulations prescribed by it from time to time	A and C	SH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM	
FM4.29	Demonstrate ability to communicate appropriately with media, public and doctors	A and C	KH/SH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM	
FM4.30	Demonstrate ability to conduct research in pursuance to guidelines or research ethics	A and C	KH/SH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM	
Topic: Forensic Psychiatry		**Number of competencies: (06)**				**Number of procedures that require certification: (NIL)**			
FM5.1	Classify common mental illnesses including post-traumatic stress disorder (PTSD)	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		Psychiatry	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
FM5.2	Define, classify and describe delusions, hallucinations, illusion, lucid interval and obsessions with exemplification	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		Psychiatry	
FM5.3	Describe Civil and criminal responsibilities of a mentally ill person	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		Psychiatry	
FM5.4	Differentiate between true insanity from feigned insanity	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		Psychiatry	
FM5.5	Describe & discuss Delirium tremens	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		Psychiatry, General Medicine	
FM5.6	Describe the Indian Mental Health Act, 1987 with special reference to admission, care and discharge of a mentally ill person	K	K/KH	N	Lecture, Small group discussion	Written/ Viva voce		Psychiatry	
Topic: Forensic Laboratory investigation in medical legal practice		**Number of competencies: (03)**				**Number of procedures that require certification: (NIL)**			
FM6.1	Describe different types of specimen and tissues to be collected both in the living and dead: Body fluids (blood, urine, semen, faeces saliva), Skin, Nails, tooth pulp, vaginal smear, viscera, skull, specimen for histo-pathological examination, blood grouping, HLA Typing and DNA Fingerprinting. Describe Locard's Exchange Principle	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
FM6.2	Describe the methods of sample collection, preservation, labelling, dispatch, and interpretation of reports	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce			
FM6.3	Demonstrate professionalism while sending the biological or trace evidences to Forensic Science laboratory, specifying the required tests to be carried out, objectives of preservation of evidences sent for examination, personal discussions on interpretation of findings	A and C	KH/SH	Y	Lecture, Small group discussions, DOAP sessions	Viva voce / OSPE			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
Topic: Emerging technologies in Forensic Medicine		**Number of competencies: (01)**				**Number of procedures that require certification:(NIL)**			
FM7.1	Enumerate the indications and describe the principles and appropriate use for: - DNA profiling - Facial reconstruction - Polygraph (Lie Detector) - Narcoanalysis, - Brain Mapping, - Digital autopsy, - Virtual Autopsy, - Imaging technologies	K	K/KH	N	Lecture, Small group discussion	Written/ Viva voce			
Topic: Toxicology: General Toxicology		**Number of competencies: (10)**				**Number of procedures that require certification: (NIL)**			
FM8.1	Describe the history of Toxicology	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
FM8.2	Define the terms Toxicology, Forensic Toxicology, Clinical Toxicology and poison	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
FM8.3	Describe the various types of poisons, Toxicokinetics, and Toxicodynamics and diagnosis of poisoning in living and dead	K	K/KH	Y	Lecture, Small group discussion	Written/viva voce		Pharmacology	
FM8.4	Describe the Laws in relations to poisons including NDPS Act, Medico-legal aspects of poisons	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
FM8.5	Describe Medico-legal autopsy in cases of poisoning including preservation and dispatch of viscera for chemical analysis	K	K/KH	Y	Lecture, Small group discussion, Autopsy, DOAP session	Written/ Viva voce/ OSPE		Pharmacology	
FM8.6	Describe the general symptoms, principles of diagnosis and management of common poisons encountered in India	K	K/KH	Y	Lecture, Small group discussion, Bed side clinic, DOAP session	Written/ Viva voce/ OSCE		Pharmacology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
FM8.7	Describe simple Bedside clinic tests to detect poison/drug in a patient's body fluids	K	K/KH	Y	Lecture, Small group discussion, Bed side clinic, DOAP session	Written/ Viva voce/ OSCE		Pharmacology, General Medicine	
FM8.8	Describe basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination	K	K/KH	Y	Lecture, Small group discussion, Bed side clinic, DOAP session	Written/ Viva voce/ OSCE		Pharmacology, General Medicine	
FM8.9	Describe the procedure of intimation of suspicious cases or actual cases of foul play to the police, maintenance of records, preservation and despatch of relevant samples for laboratory analysis.	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce			
FM8.10	Describe the general principles of Analytical Toxicology and give a brief description of analytical methods available for toxicological analysis: Chromatography – Thin Layer Chromatography, Gas Chromatography, Liquid Chromatography and Atomic Absorption Spectroscopy	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce			
Topic: Toxicology : Chemical Toxicology		**Number of competencies: (06)**				**Number of procedures that require certification : (NIL)**			
FM9.1	Describe General Principles and basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination with regard to: Caustics Inorganic – sulphuric, nitric, and hydrochloric acids; Organic-Carboloic Acid (phenol), Oxalic and acetylsalicylic acids	K	K/KH	Y	Lecture, Small group discussion, Bed side clinic, Autopsy, DOAP session	Written/ Viva voce/ OSCE		Pharmacology, General Medicine	
FM9.2	Describe General Principles and basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination with regard to Phosphorus, Iodine, Barium	K	K/KH	Y	Lecture, Small group discussion, Bed side clinic, Autopsy, DOAP session	Written/ Viva voce/ OSCE		Pharmacology, General Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
FM9.3	Describe General Principles and basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination with regard to Arsenic, lead, mercury, copper, iron, cadmium and thallium	K	K/KH	Y	Lecture, Small group discussion, Bed side clinic, Autopsy, DOAP session	Written/ Viva voce/ OSCE		Pharmacology, General Medicine	
FM9.4	Describe General Principles and basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination with regard to Ethanol, methanol, ethylene glycol	K	K/KH	Y	Lecture, Small group discussion, Bed side clinic, Autopsy, DOAP session	Written/ Viva voce/ OSCE		Pharmacology, General Medicine	
FM9.5	Describe General Principles and basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination with regard to Organophosphates, Carbamates, Organochlorines, Pyrethroids, Paraquat, Aluminium and Zinc phosphide	K	K/KH	Y	Lecture, Small group discussion, Bed side clinic, Autopsy, DOAP session	Written/ Viva voce/ OSCE		Pharmacology, General Medicine	
FM9.6	Describe General Principles and basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination with regard to Ammonia, carbon monoxide, hydrogen cyanide & derivatives, methyl isocyanate, tear (riot control) gases	K	K/KH	Y	Lecture, Small group discussion, Bed side clinic, Autopsy, DOAP session	Written/ Viva voce/ OSCE		Pharmacology, General Medicine	
Topic: Toxicology : Pharmaceutical Toxicology		**Number of competencies: (01)**				**Number of procedures that require certification : (NIL)**			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
FM10.1	Describe General Principles and basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination with regard to: i. Antipyretics – Paracetamol, Salicylates ii. Anti-Infectives (Common antibiotics – an overview) iii. Neuropsychotoxicology Barbiturates, benzodiazepins phenytoin, lithium, haloperidol, neuroleptics, tricyclics iv .Narcotic Analgesics, Anaesthetics, and Muscle Relaxants v. Cardiovascular Toxicology Cardiotoxic plants – oleander, odollam, aconite, digitalis vi.Gastro-Intestinal and Endocrinal Drugs – Insulin	K	K/KH	Y	Lecture, Small group discussion, Bed side clinic, Autopsy, DOAP session	Written/ Viva voce/ OSCE		Pharmacology, General Medicine	
Topic: Toxicology : Biotoxicology		**Number of competencies: (01)**				**Number of procedures that require certification : (NIL)**			
FM11.1	Describe features and management of Snake bite, scorpion sting, bee and wasp sting and spider bite	K	K/KH	Y	Lecture, Small group discussion, Autopsy	Written/ Viva voce		General Medicine	
Topic: Toxicology : Sociomedical Toxicology		**Number of competencies: (01)**				**Number of procedures that require certification : (NIL)**			
FM12.1	Describe features and management of abuse/poisoning with following camicals: Tobacco, cannabis, amphetamines, cocaine, hallucinogens, designer drugs & solvent	K	K/KH	Y	Lecture, Small group discussion, Autopsy	Written/ Viva voce		General Medicine	
Topic: Toxicology : Environmental Toxicology		**Number of competencies: (02)**				**Number of procedures that require certification : (NIL)**			
FM13.1	Describe toxic pollution of environment, its medico-legal aspects & toxic hazards of occupation and industry	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
FM13.2	Describe medico-legal aspects of poisoning in Workman's Compensation Act	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
Topic: Skills in Forensic Medicine & Toxicology		**Number of competencies: (22)**				**Number of procedures that require certification: (NIL)**			
FM14.1	Examine and prepare Medico-legal report of an injured person with different etiologies in a simulated/ supervised environment	S	SH/P	Y	Bedside clinic (ward/ casualty), Small group discussion	Log book/ Skill station/ Viva voce / OSCE			
FM14.2	Demonstrate the correct technique of clinical examination in a suspected case of poisoning & prepare medico-legal report in a simulated/ supervised environment	S	SH	Y	Bedside clinic (ward/casualty), Small Group discussion	Log book/ Skill station/ Viva voce / OSCE		General Medicine	
FM14.3	Assist and demonstrate the proper technique in collecting, preserving and dispatch of the exhibits in a suspected case of poisoning, along with clinical examination	S	SH	Y	Bedside clinic, Small Group discussion, DOAP session	Skill lab/ Viva voce		General Medicine	
FM14.4	Conduct and prepare report of estimation of age of a person for medico-legal and other purposes & prepare medico-legal report in a simulated/ supervised environment	S	KH	Y	Small group discussion, Demonstration	Log book/ Skill station/ Viva voce / OSCE			
FM14.5	Conduct & prepare post-mortem examination report of varied etiologies (at least 15) in a simulated/ supervised environment	S	KH	Y	Small group discussion, Autopsy, DOAP session	Log book/ Skill station/ Viva voce / OSCE			
FM14.6	Demonstrate and interpret medico-legal aspects from examination of hair (human & animal) fibre, semen & other biological fluids	S	KH	Y	Small group discussion, Lecture	Log book/ Skill station/ Viva voce / OSCE			
FM14.7	Demonstrate & identify that a particular stain is blood and identify the species of its origin	S	KH	Y	Small group discussion, Lecture	Log book/Skill station/Viva voce		Pathology, Physiology	
FM14.8	Demonstrate the correct technique to perform and identify ABO & RH blood group of a person	S	SH	Y	Small group discussion, DOAP session	Log book/Skill station/Viva voce		Pathology, Physiology	
FM14.9	Demonstrate examination of & present an opinion after examination of skeletal remains in a simulated/ supervised environment	S	SH	Y	Small group discussion, DOAP session	Log book/Skill station/Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
FM14.10	Demonstrate ability to identify & prepare medicolegal inference from specimens obtained from various types of injuries e.g. contusion, abrasion, laceration, firearm wounds, burns, head injury and fracture of bone	S	KH	Y	Small group discussion, DOAP session	Log book/Skill station/ Viva voce/ OSPE			
FM14.11	To identify & describe weapons of medicolegal importance which are commonly used e.g. lathi, knife, kripan, axe, gandasa, gupti, farsha, dagger, bhalla, razor & stick. Able to prepare report of the weapons brought by police and to give opinion regarding injuries present on the person as described in injury report/ PM report so as to connect weapon with the injuries. (Prepare injury report/ PM report must be provided to connect the weapon with the injuries)	S	KH	Y	Small group discussion, DOAP session	Log book/Skill station/ Viva voce/ OSPE			
FM14.12	Describe the contents and structure of bullet and cartridges used & to provide medico-legal interpretation from these	S	KH	Y	Small group discussion, DOAP session	Log book/ Skill station/Viva voce			
FM14.13	To estimate the age of foetus by post-mortem examination	S	KH	Y	Small group discussion, DOAP session	Theory/ Clinical assessment/ Viva voce			
FM14.14	To examine & prepare report of an alleged accused in rape/unnatural sexual offence in a simulated/ supervised environment	S	KH	Y	Small group discussion, DOAP session	Log book/ Skill station/ Viva voce / OSCE			
FM14.15	To examine & prepare medico-legal report of a victim of sexual offence/unnatural sexual offence in a simulated/ supervised environment	S	KH	Y	Small group discussion, DOAP session	Log book/ Skill station/ Viva voce / OSCE			
FM14.16	To examine & prepare medico-legal report of drunk person in a simulated/ supervised environment	S	KH	Y	Small group discussion, Bed side clinic, DOAP session	Log book/ Skill station/ Viva voce / OSCE			
FM14.17	To identify & draw medico-legal inference from common poisons e.g. dhatura, castor, cannabis, opium, aconite copper sulphate, pesticides compounds, marking nut, oleander, Nux vomica, abrus seeds, Snakes, capsicum, calotropis, lead compounds & tobacco.	S	KH	Y	Small group discussion, DOAP session	Log book/ Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
FM14.18	To examine & prepare medico-legal report of a person in police, judicial custody or referred by Court of Law and violation of human rights as requirement of NHRC, who has been brought for medical examination	S	KH	Y	Small group discussion, DOAP session	Log book/ Skill station/ Viva voce / OSCE			
FM14.19	To identify & prepare medico-legal inference from histo-pathological slides of Myocardial Infarction, pneumonitis, tuberculosis, brain infarct, liver cirrhosis, brain haemorrhage, bone fracture, Pulmonary oedema, brain oedema, soot particles, diatoms & wound healing	S	KH	Y	Small group discussion, DOAP session	Log book/ Skill station/ Viva voce			
FM14.20	To record and certify dying declaration in a simulated/ supervised environment	S	KH	Y	Small group discussion, Role Play, Bed side clinic DOAP session	Log book/ Skill station/ Viva voce /OSCE			
FM14.21	To collect, preserve, seal and dispatch exhibits for DNA-Finger printing using various formats of different laboratories.	S	KH	Y	Small group discussion, Lecture	Log book/ Skill station/Viva voce			
FM14.22	To give expert medical/ medico-legal evidence in Court of law	S	KH	Y	Small group discussion, Lecture, DOAP session, role play, Court Visits	Log book/ Viva voce/OSCE			
	Column C: K- Knowledge, S – Skill, A - Attitude / professionalism, C- Communication. **Column D: K – Knows, KH - Knows How, SH - Shows how, P- performs independently,** **Column F: DOAP session – Demonstrate, Observe, Assess, Perform.** **Column H: If entry is P: indicate how many procedures must be done independently for certification/ graduation**								
Integration									
	Human Anatomy								
AN14.3	Describe the importance of ossification of lower end of femur & upper end of tibia	K	KH	Y	Lecture	Viva voce/Practicals		Forensic Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
Pharmacology									
PH1.22	Describe drugs of abuse (dependence, addiction, stimulants, depressants, psychedelics, drugs used for criminal offences)	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Psychiatry	Forensic Medicine
PH5.7	Demonstrate an understanding of the legal and ethical aspects of prescribing drugs	K	KH	Y	Small group discussion	short note/Viva voce			Forensic Medicine
Radiodiagnosis									
RD1.13	Describe the components of the PC & PNDT act and its medicolegal implications	K	KH	Y	Lecture, Small group discussion			Obstetrics & Gynaecology, Forensic Medicine	
Psychiatry									
PS19.3	Describe and discuss the basic legal and ethical issues in psychiatry	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Forensic Medicine AETCOM	
General Medicine									
IM20.1	Enumerate the poisonous snakes of your area and describe the distinguishing marks of each	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Forensic Medicine, Pharmacology	
IM20.2	Describe, demonstrate in a volunteer or a mannequin and educate (to other health care workers / patients) the correct initial management of patient with a snake bite in the field	S	SH	Y	DOAP session	Skill assessment/ Written/ Viva voce		Forensic Medicine	
IM20.3	Describe the initial approach to the stabilisation of the patient who presents with snake bite	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Forensic Medicine	
IM20.4	Elicit and document and present an appropriate history, the circumstance, time, kind of snake, evolution of symptoms in a patient with snake bite	S	SH	Y	Bedside clinic, DOAP session	Skill assessment		Forensic Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
IM21.2	Enumerate the common plant poisons seen in your area and describe their toxicology, clinical features, prognosis and specific approach to detoxification	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Forensic Medicine, Pharmacology	
IM21.3	Enumerate the common corrosives used in your area and describe their toxicology, clinical features, prognosis and approach to therapy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Forensic Medicine, Pharmacology	
IM21.4	Enumerate the commonly observed drug overdose in your area and describe their toxicology, clinical features, prognosis and approach to therapy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Forensic Medicine, Pharmacology	
IM21.5	Observe and describe the functions and role of a poison center in suspected poisoning	S	KH	Y	DOAP session	document in log book		Forensic Medicine, Pharmacology	
IM21.6	Describe the medico legal aspects of suspected suicidal or homicidal poisoning and demonstrate the correct procedure to write a medico legal report on a suspected poisoning	S	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		Forensic Medicine, Pharmacology	
IM21.7	Counsel family members of a patient with suspected poisoning about the clinical and medico legal aspects with empathy	A/C	SH	Y	DOAP session	Skill assessment		Forensic Medicine, Pharmacology	
IM21.8	Enumerate the indications for psychiatric consultation and describe the precautions to be taken in a patient with suspected suicidal ideation / gesture	K	KH	Y	DOAP session	Skill assessment		Forensic Medicine, Psychiatry	
Obstetrics & Gynaecology									
OG1.3	Define and Discuss still birth and abortion	K	KH	Y	Lecture, Small group discussions	Short notes		Forensic Medicine	
OG9.2	Describe the steps and observe/ assist in the performance of an MTP evacuation	S	SH	Y	DOAP session, Bedside clinic	Viva voce		Forensic Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
OG20.1	Enumerate the indications and describe and discuss the legal aspects, indications, methods for first and second trimester MTP; complications and management of complications of medical termination of pregnancy	K	KH	Y	Lecture, Small group discussions	Written/ Viva voce		Forensic Medicine	
OG20.2	In a simulated environment administer informed consent to a person wishing to undergo medical termination of pregnancy	S/A/C	SH	Y	DOAP session	Skill assessment		Forensic Medicine	
OG20.3	Discuss Pre-conception and Pre Natal Diagnostic Techniques (PC& PNDT) Act 1994 & its amendments	K	K/KH	Y	Lecture, Small group discussions	Written/ Viva voce		Forensic Medicine	
General Surgery									
SU8.1	Describe the principles of Ethics as it pertains to surgery	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce/ skill assessment		Forensic Medicine, AETCOM	
SU8.2	Demonstrate Professionalism and empathy to the patient undergoing surgery	A/C	SH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		Forensic Medicine, AETCOM	
SU8.3	Discuss Medico legal issues in surgical practice	A/C	KH	Y	Lecture, Small group discussion	Written/ Viva voce/ skill assessment		Forensic Medicine, AETCOM	

List of contributing subject Experts

1. Human Anatomy

- Dr. Praveen R Singh, Professor & Head, Department of Anatomy, Pramukhswami Medical College, Karamsad, Gujarat
- Dr. Nachiket Shankar, Associate Professor, Department of Anatomy, St. John's Medical College & Hospital, Bangalore

2. Physiology

- Dr. Mario Vaz, Professor, Department of Physiology, St. John's Medical College & Hospital, Bangalore
- Dr. Jayashree Sengupta, Former Professor & Head, Department of Physiology, All India Institute of Medical Sciences, New Delhi.
- Dr Hasmukh D Shah, Professor & Head, Department of Physiology, Pramukhswami Medical College, Karamsad, Gujarat

3. Biochemistry

- Dr. Nibhriti Das, Professor, Department of Biochemistry, All India Institute of Medical Sciences, New Delhi
- Dr. S. P. Singh, Professor, Department of Biochemistry, Maharani Laxmi Bai Medical College, Jhansi, Uttar Pradesh
- Dr. Hitesh N Shah, Professor & Head, Department of Biochemistry, Pramukhswami Medical College, Karamsad, Gujarat

4. Pharmacology

- Dr. S. K. Maulik, Professor, Department of Pharmacology, All India Institute of Medical Sciences, New Delhi
- Dr. Vandana Roy, Professor, Department of Pharmacology, Maulana Azad Medical College, New Delhi

5. Pathology

- Dr. S. Datta Gupta, Professor, Department of Pathology, All India Institute of Medical Sciences, New Delhi
- Dr. Uma Chaturvedi, Professor, C-1303, Freedom Park Life, Sector- 57, Gurugram

6. Microbiology

- Dr. S. Geetalakshmi, Dean, Professor, Department of Microbiology, Stanley Medical College, Chennai, Tamil Nadu.
- Dr. Padma Srikanth, Professor, Department of Microbiology, Sri Ramachandra Medical College & Research Institute, Chennai
- Dr. Suman Singh, Professor, Department of Microbiology, Pramukhswami Medical College, Karamsad, Gujarat

7. Forensic Medicine & Toxicology

- Dr. Sanjeev Lalwani, Professor & Registrar (Academics), Department of Forensic Medicine, All India Institute of Medical Sciences, New Delhi
- Dr. T. D. Dogra, Former Director & Former Head, Department of Forensic Medicine, All India Institute of Medical Sciences, New Delhi; currently, Vice Chancellor, SGT University, Gurugram
- Col. Ravi Rautji, Professor & Head, Department of Forensic Medicine, Commanding Officer, Directorate General of Medical Services (Army), New Delhi
- Dr. S.D. Nanandkar, Professor & Head, Department of Forensic Medicine, Grant Government Medical College & Sir J.J. Group of Hospitals, Mumbai
- Dr. Indrajit L. Khandekar, In-charge CFMU and Associate Professor, Department of Forensic Medicine & Toxicology, MGIMS and Kasturba Hospital, Sewagram, Wardha.
- Dr. S. B. Punpale, Professor & Head, Department of Forensic Medicine, B. J. Medical College, Pune, Maharashtra

8. Community Medicine

- Dr. B. S. Garg, Professor & Head, Department of Community Medicine, Mahatama Gandhi Institute of Medical Sciences, Wardha, Sewagram, Maharashtra
- Dr. Umesh Kapil, Professor, Department of Community Medicine, All India Institute of Medical Sciences, New Delhi
- Dr. Sanjay Zodpey, Director, Public Health Foundation of India, Isid Campus, 4 Institutional Area, Vasant Kunj, New Delhi
- Dr. Saudan Singh, Professor, Department of Community Medicine, Vardhman Mahavir Medical College & Safdarjung Hospital, New Delhi
- Dr. Dinesh Kumar, Professor, Department of Community Medicine, Pramukhswami Medical College, Karamsad, Gujarat
- Dr. Pankaj B. Shah, Professor, Deartment of Community Medicine, Sri Ramachandra Medical College & Research Institute, Chennai.

9. General Medicine & Respiratory Medicine

- Dr. Krishna G. Seshadri, Visiting Professor, Endocrinology & Metabolism, Balaji Vidyapeeth, Puducherry
- Dr. M. K. Bhatnagar, Director Professor, Department of General Medicine, Lady Hardinge Medical College, New Delhi
- Dr. Aparna Agarwal, Director Professor of Medicine, Lady Hardinge Medical College, New Delhi
- Dr. Anil Gurtoo, Director Professor of Medicine, Lady Hardinge Medical College, New Delhi

10. Pediatrics

- Dr. Harish Chellani, Professor of Pediatrics, Vardhman Mahavir Medical College & Safdarjung Hospital, New Delhi
- Dr. A. K. Dutta, Former Head, Kalawati Saran Children's Hospital, New Delhi

- Dr. S. Aneja, Director Professor & Head, Department of Pediatrics, Kalawati Saran Children's Hospital, New Delhi
- Dr. Latha Ravichandran, Professor, Deartment of Paediatrics, Sri Ramachandra Medical College & Research Institute, Chennai.

11. Psychiatry

- Dr. Rakesh Kumar Chadda, Department of Psychiatry, All India Institute of Medical Sciences, New Delhi
- Dr. N. M. Patil, Professor, Department of Psychiatry, Jawaharlal Nehru Medical College, Belagavi
- Dr. Rajesh Rastogi, Consultant & Head Department of Psychiatry, Vardhman Mahavir Medical College & Safdarjung Hospital, New Delhi.
- Dr. Jagdish R Varma, Associate Professor, Department of Psychiatry, Pramukhswami Medical College, Karamsad, Gujarat

12. Dermatology, Venereology & Leprosy

- Dr. R. K. Gautam, Professor, Department of Dermatology, Venereology & Leprosy, Dr. Ram Manohar Lohia Hospital, New Delhi.
- Dr. Sujay Khandpur, Professor, Department of Dermatology, Venereology & Leprosy, All India Institute of Medical Sciences, New Delhi
- Dr. S. Murugan, Associate Professor of Dermatology, Sri Ramachandra Medical College & Research Institute, Chennai

13. Physical Medicine and Rehabilitation

- Dr. Sanjay Wadhwa, Professor, Department of Physical Medicine & Rehabilitation, All India Institute of Medical Sciences, New Delhi
- Dr. George Tharion, Head, Department of Physical Medicine & Rehabilitation, Christian Medical College, Vellore, Tamil Nadu

- Dr. Jagdish Menon, Professor & Head, Department of Orthopaedics and Dept. of Physical & Rehabilitative Medicine, Jawaharlal Institute of Postgraduate Medical Education and Research, Pondicherry

14. General Surgery

- Dr. N Ananthakrishnan, 2A Vairam Enclave, Siddhananda Nagar, Pondicherry -605005.
- Dr. P. V. Chalam, Former Professor, Department of Surgery, Gandhi Medical College, Secunderabad, Telengana.
- Dr. Dinesh Bhatnagar, Professor, Department of General Surgery, North Delhi Municipal Corporation Medical College, Hindu Rao Hospital, Malka Ganj, Delhi

15. Ophthalmology

- Dr. Smita Singh, Professor, Department of Ophthalmology, Mahatma Gandhi Institute of Medical Sciences, Wardha

16. Oto-rhino-laryngology

- Dr. Achal Gulati, Director Professor, Department of ENT, Maulana Azad Medical College, New Delhi
- Dr. Ravi Kumar, Professor & Head, Department of ENT, Sri Ramachandra Medical College & Research Institute, Chennai
- Dr. Suma Mathew, Professor, Department of ENT, Christian Medical College, Vellore, Tamil Nadu

17. Obstetrics and Gynaecology

- Dr. Neerja Bhatla, Professor, Department of Obstetrics & Gynecology, All India Institute of Medical Sciences, New Delhi
- Dr. Annie Regi, Professor & Head, Department of Obstetrics & Gynecology, Christian Medical College, Vellore, Tamil Nadu
- Dr. Usha Vishwanath, Professor, Department of Obstetrics & Gynecology, Sri Ramachandra Medical College & Research Institute, Chennai

18. Orthopaedics

- Dr. P.V. Vijayaraghavan, Vice Chancellor & Professor of Orthopedics, Sri Ramachandra Medical College & Research Institute, Chennai
- Dr. Raj Bahadur, Professor & Head, Department of Orthopaedics, Postgraduate Institute of Medical Sciences, Chandigarh
- Dr. SC. Goel, Professor, Department of Orthopaedics, Institute of Medical Sciences, BHU, Varanasi, Uttar Pradesh

19. Anaesthesiology

- Dr. Baljit Singh, Director Professor of Anaesthesia, G. B. Pant Hospital, Delhi
- Dr. Ramesh Keshav, Department of Anaesthesia, Dr. Ram Manohar Lohia Hospital, New Delhi
- Dr. Mridula Pawar, Consultant & Head, Department of Anaesthesia, Vardhman Mahavir Medical College & Safdarjung Hospital, New Delhi

20. Radio- Diagnosis

- Dr. Kishor Taori (late), Professor & Head, Department of Radiodiagnosis, Government Medical College, Nagpur

21. Radiotherapy

- Dr. P. K. Jhulka, Dean & Professor of Radiotherapy, All India Institute of Medical Sciences, New Delhi.
- Dr. Shyam Shrivastava, Head, Department of Radiation, Tata Memorial Hospital, Mumbai

22. Dentistry

- Dr. Sridevi Padmanabhan, Professor, Department of Orthodontics, Faculty of Dental Sciences, Sri Ramchandra Medical College & Research Institute, Chennai

MEDICAL COUNCIL OF INDIA

COMPETENCY BASED UNDERGRADUATE CURRICULUM FOR THE INDIAN MEDICAL GRADUATE

Knows → Knows how → Shows → Shows how → Performs

Enumerate | Describe | Observe | Demonstrate | Assist

Counsel

Analyse

Guide

Correlate

Critique

Prescribe

Integrate

Communicate

Interpret

Collaborate

Clinician | Communicator | Team Leader | Professional | Lifelong Learner

Knowledge | Skills | Attitude | Values | Responsiveness | Communication

VOLUME-II (2018)

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2018

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भारतीय आयुर्विज्ञान परिषद के अधिक्रमण में शासी बोर्ड

BOARD OF GOVERNORS
IN SUPERSESSION OF MEDICAL COUNCIL OF INDIA

FOREWORD

The Medical Council of India, aware of its responsibilities in creation of trained health manpower, has been engaged for the past few years in updating the medical curriculum for undergraduates and postgraduates to be in consonance with the changing health needs of the country. The task of updating and reorganization of the postgraduate curriculum in nearly 50 broad specialty disciplines to the competency pattern was accomplished by the Academic Cell of the Council with the help of subject experts and members of its Reconciliation Board and have been uploaded on the Council Website for use of the medical fraternity.

The Council visualized that the Indian Medical Graduate, at the end of the undergraduate training program, should be able to recognize "health for all" as a national goal and should be able to fulfill his/her societal obligations towards the realization of this goal. To fulfill the mandate of the undergraduate medical curriculum which is to produce a clinician, who understands and is able to provide preventive, promotive, curative, palliative and holistic care to his patients, the curriculum must enunciate clearly the competencies the student must be imparted and must have learnt, with clearly defined teaching-learning strategies and effective methods of assessment. The student should be trained to effectively communicate with patients and their relatives in a manner respectful of the patient's preferences, values, beliefs, confidentiality and privacy and to this purpose, a book on Attitude, Ethics & Communication was prepared by the Medical Council of India; the teaching faculty of medical colleges have been receiving training on this module since 2015.

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Competency based Medical Education provides an effective outcome-based strategy where various domains of teaching including teaching learning methods and assessment form the framework of competencies. Keeping this objective as the core ingredient, the Medical Council of India with the help of panel of experts drawn from across the country, laid the basic framework for the revised undergraduate medical curriculum. Over the past four years, a group of highly committed medical professionals working as Members of the MCI Reconciliation Board developed this information into a document incorporating appropriate teaching-learning strategies, tools and techniques of teaching, and modes of assessment which have culminated in the current competency based undergraduate curriculum. We understand that maximum efforts were made to encourage integrated teaching between traditional subject areas using a problem-based learning approach starting with clinical or community cases and exploring the relevance of various preclinical disciplines in both the understanding and resolution of the problem. All efforts have been made to de-emphasize compartmentalisation of disciplines so as to achieve both horizontal and vertical integration in different phases. We are proud of their work accomplishment and congratulate them in the onerous task accomplished.

It gives us great satisfaction to state that the **'competency based undergraduate curriculum'** that has been prepared by the Medical Council of India would definitely serve the cause of medical education and in creating a competent Indian Medical Graduate to serve the community.

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COMPETENCY BASED UNDERGRADUATE CURRICULUM
FOR
THE INDIAN MEDICAL GRADUATE

Preamble

The new Graduate Medical Education Regulations attempts to stand on the shoulder of the contributions and the efforts of resource persons, teachers and students (past and present). It intends to take the learner to provide health care to the evolving needs of the nation and the world.

More than twenty years have passed since the existing Regulations on Graduate Medical Education, 1997 was notified, necessitating a relook at all aspects of the various components in the existing regulations and adapt them to the changing demography, socio-economic context, perceptions, values and expectations of stakeholders. Emerging health care issues particularly in the context of emerging diseases, impact of advances in science and technology and shorter distances on diseases and their management also need consideration. The strong and forward looking fundamentals enshrined in the Regulations on Graduate Medical Education, 1997 has made this job easier. A comparison between the 1997 Regulations and proposed Graduate Medical Education Regulations, 2018 will reveal that the 2018 Regulations have evolved from several key principles enshrined in the 1997 Regulations.

The thrust in the new regulations is continuation and evolution of thought in medical education making it more learner-centric, patient-centric, gender-sensitive, outcome -oriented and environment appropriate. The result is an outcome driven curriculum which conforms to global trends. Emphasis is made on alignment and integration of subjects both horizontally and vertically while respecting the strengths and necessity of subject-based instruction and assessment. This has necessitated a deviation from using “broad competencies”; instead, the reports have written end of phase subject (sub) competencies. These “sub-competencies” can be mapped to the global competencies in the Graduate Medical Education Regulations.

A significant attempt has been made in the outcome driven undergraduate curriculum to provide the orientation and the skills necessary for life-long learning to enable proper care of the patient. In particular, the curriculum provides for early clinical exposure, electives and longitudinal care. Skill acquisition is an indispensable component of the learning process in medicine. The curriculum reinforces this aspect by necessitating certification of certain essential skills. The experts and the writing group have factored in patient availability, access, consent, number of students in a class etc. in suggesting skill acquisition and assessment methods; use of skills labs, simulated and guided environments are encouraged. In the pre-internship years,- the highest level of skill acquisition is a show how (SH) in a simulated or guided environment; few skills require independent performance and certification - these are marked with P (for performance). Opportunity to 'perform' these skills will be available during internship.

The importance of ethical values, responsiveness to the needs of the patient and acquisition of communication skills is underscored by providing dedicated curriculum time in the form of a longitudinal program based on Attitude, Ethics and Communication (AETCOM) competencies. Great emphasis has been placed on collaborative and inter-disciplinary teamwork, professionalism, altruism and respect in professional relationships with due sensitivity to differences in thought, social and economic position and gender.

In addition to the above, an attempt has been made to allow students from diverse educational streams and backgrounds to transition appropriately through a Foundation Course. Dedicated time has been allotted for self directed learning and co-curricular activities.

Formative and internal assessments have been streamlined to achieve the objectives of the curriculum. Minor tweaks to the summative assessment have been made to reflect evolving thought and regulatory requirements. Curricular governance and support have been strengthened, increasing the involvement of Curriculum Committee and Medical Education Departments/Units.

The curriculum document in conjunction with the new Graduate Medical Education Regulations (GMR), when notified, must be seen as a "living document" that should evolve as stakeholder requirements and aspirations change. We hope that the current GMR does just that. The Medical Council of India is

grateful to all the teachers, subject experts, process experts, patients, students and trainees who have contributed through invaluable inputs, intellectual feedbacks and valuable time spent to make this possible. This document would not have been possible without the dedicated and unstinting intellectual, mental and time-consuming efforts of the members of the Reconciliation Board of the Council and the Academic Cell of MCI.

How to use the Manual

This Manual is intended for curriculum planners in an institution to design learning and assessment experiences for the MBBS student. Contents created by subject experts have been curated to provide guidance for the curriculum planners, leaders and teachers in medical schools. They must be used with reference to and in the context of the Regulations.

Section 1

Competencies for the Indian Medical Graduate

Section 1 - provides the global competencies extracted from the Graduate Medical Education Regulations, 2018. The global competencies identified as defining the roles of the **Indian Medical Graduate** are the broad competencies that the learner has to aspire to achieve; teachers and curriculum planners must ensure that the learning experiences are aligned to this Manual.

Extract from the Graduate Medical Education Regulations, 2018

2. Objectives of the Indian Graduate Medical Training Programme

The undergraduate medical education program is designed with a goal to create an "Indian Medical Graduate" (IMG) possessing requisite knowledge, skills, attitudes, values and responsiveness, so that she or he may function appropriately and effectively as a physician of first contact of the community while being globally relevant. To achieve this, the following national and institutional goals for the learner of the Indian Medical Graduate training program are hereby prescribed:-

2.1. National Goals

At the end of undergraduate program, the Indian Medical Graduate should be able to:

(a) recognize “health for all” as a national goal and health right of all citizens and by undergoing training for medical profession fulfill his/her social obligations towards realization of this goal.

(b) learn every aspect of National policies on health and devote herself/himself to its practical implementation.

(c) achieve competence in practice of holistic medicine, encompassing promotive, preventive, curative and rehabilitative aspects of common diseases.

(d) develop scientific temper, acquire educational experience for proficiency in profession and promote healthy living.

(e) become exemplary citizen by observance of medical ethics and fulfilling social and professional obligations, so as to respond to national aspirations.

2.2. Institutional Goals

In consonance with the national goals, each medical institution should evolve institutional goals to define the kind of trained manpower (or professionals) they intend to produce. The Indian Medical Graduates coming out of a medical institute should:

(a) be competent in diagnosis and management of common health problems of the individual and the community, commensurate with his/her position as a member of the health team at the primary, secondary or tertiary levels, using his/her clinical skills based on history, physical examination and relevant investigations.

(b) be competent to practice preventive, promotive, curative and rehabilitative medicine in respect to the commonly encountered health problems.

(c) appreciate rationale for different therapeutic modalities, be familiar with the administration of the "essential drugs" and their common side effects.

(d) be able to appreciate the socio-psychological, cultural, economic and environmental factors affecting health and develop humane attitude towards the patients in discharging one's professional responsibilities.

(e) possess the attitude for continued self learning and to seek further expertise or to pursue research in any chosen area of medicine, action research and documentation skills.

(f) be familiar with the basic factors which are essential for the implementation of the National Health Programs including practical aspects of the following:

(i) Family Welfare and Maternal and Child Health (MCH);

(ii) Sanitation and water supply;

(iii) Prevention and control of communicable and non-communicable diseases;

(iv) Immunization;

(v) Health Education;

(vi) Indian Public Health Standards (IPHS) at various level of service delivery;

(vii) Bio-medical waste disposal; and

(viii) Organizational and or institutional arrangements.

(g) acquire basic management skills in the area of human resources, materials and resource management related to health care delivery, General and hospital management, principal inventory skills and counseling.

(h) be able to identify community health problems and learn to work to resolve these by designing, instituting corrective steps and evaluating outcome of such measures.

(i) be able to work as a leading partner in health care teams and acquire proficiency in communication skills.

(j) be competent to work in a variety of health care settings.

(k) have personal characteristics and attitudes required for professional life including personal integrity, sense of responsibility and dependability and ability to relate to or show concern for other individuals.

All efforts must be made to equip the medical graduate to acquire the skills as detailed in Table 11 Certifiable procedural skills – A Comprehensive list of skills recommended as desirable for Bachelor of Medicine and Bachelor of Surgery (MBBS) – Indian Medical Graduate, as given in the Graduate Medical Education Regulations, 2018

2. 3. Goals for the Learner

In order to fulfil this goal, the Indian Medical Graduate must be able to function in the following roles appropriately and effectively:-

2.3.1. Clinician who understands and provides preventive, promotive, curative, palliative and holistic care with compassion.

2.3.2. Leader and member of the health care team and system with capabilities to collect, analyze, synthesize and communicate health data appropriately.

2.3.3. Communicator with patients, families, colleagues and community.

2.3.4. Lifelong learner committed to continuous improvement of skills and knowledge.

2.3.5. Professional, who is committed to excellence, is ethical, responsive and accountable to patients, community and profession.

3. Competency Based Training Programme of the Indian Medical Graduate

Competency based learning would include designing and implementing medical education curriculum that focuses on the desired and observable ability in real life situations. In order to effectively fulfil the roles as listed in clause 2, the Indian Medical Graduate would have obtained the following set of competencies at the time of graduation:

3.1. Clinician, who understands and provides preventive, promotive, curative, palliative and holistic care with compassion

3.1.1 Demonstrate knowledge of normal human structure, function and development from a molecular, cellular, biologic, clinical, behavioral and social perspective.

3.1.2. Demonstrate knowledge of abnormal human structure, function and development from a molecular, cellular, biological, clinical, behavioural and social perspective.

3.1.3 Demonstrate knowledge of medico-legal, societal, ethical and humanitarian principles that influence health care.

3.1.4 Demonstrate knowledge of national and regional health care policies including the National Health Mission that incorporates National Rural Health Mission (NRHM) and National Urban Health Mission (NUHM), frameworks, economics and systems that influence health promotion, health care delivery, disease prevention, effectiveness, responsiveness, quality and patient safety.

3.1.5. Demonstrate ability to elicit and record from the patient, and other relevant sources including relatives and caregivers, a history that is complete and relevant to disease identification, disease prevention and health promotion.

3.1.6. Demonstrate ability to elicit and record from the patient, and other relevant sources including relatives and caregivers, a history that is contextual to gender, age, vulnerability, social and economic status, patient preferences, beliefs and values.

3.1.7 Demonstrate ability to perform a physical examination that is complete and relevant to disease identification, disease prevention and health promotion.

3.1.8 Demonstrate ability to perform a physical examination that is contextual to gender, social and economic status, patient preferences and values.

3.1.9 Demonstrate effective clinical problem solving, judgment and ability to interpret and integrate available data in order to address patient problems, generate differential diagnoses and develop individualized management plans that include preventive, promotive and therapeutic goals.

3.1.10 Maintain accurate, clear and appropriate record of the patient in conformation with legal and administrative frameworks.

3.1.11 Demonstrate ability to choose the appropriate diagnostic tests and interpret these tests based on scientific validity, cost effectiveness and clinical context.

3.1.12 Demonstrate ability to prescribe and safely administer appropriate therapies including nutritional interventions, pharmacotherapy and interventions based on the principles of rational drug therapy, scientific validity, evidence and cost that conform to established national and regional health programmes and policies for the following:

i) Disease prevention,

ii) Health promotion and cure,

iii) Pain and distress alleviation, and

iv) Rehabilitation and palliation.

3.1.13 Demonstrate ability to provide a continuum of care at the primary and/or secondary level that addresses chronicity, mental and physical disability.

3.1.14 Demonstrate ability to appropriately identify and refer patients who may require specialized or advanced tertiary care.

3.1.15 Demonstrate familiarity with basic, clinical and translational research as it applies to the care of the patient.

3.*2.* ***Leader and member of the health care team and system***

3.2.1 Work effectively and appropriately with colleagues in an inter-professional health care team respecting diversity of roles, responsibilities and competencies of other professionals.

3.2.2 Recognize and function effectively, responsibly and appropriately as a health care team leader in primary and secondary health care settings.

3.2.3 Educate and motivate other members of the team and work in a collaborative and collegial fashion that will help maximize the health care delivery potential of the team.

3.2.4 Access and utilize components of the health care system and health delivery in a manner that is appropriate, cost effective, fair and in compliance with the national health care priorities and policies, as well as be able to collect, analyze and utilize health data.

3.2.5 Participate appropriately and effectively in measures that will advance quality of health care and patient safety within the health care system.

3.2.6 Recognize and advocate health promotion, disease prevention and health care quality improvement through prevention and early recognition: in a) life style diseases and b) cancer, in collaboration with other members of the health care team.

3.3. ***Communicator with patients, families, colleagues and community***

3.3.1 Demonstrate ability to communicate adequately, sensitively, effectively and respectfully with patients in a language that the patient understands and in a manner that will improve patient satisfaction and health care outcomes.

3.3.2 Demonstrate ability to establish professional relationships with patients and families that are positive, understanding, humane, ethical, empathetic, and trustworthy.

3.3.3 Demonstrate ability to communicate with patients in a manner respectful of patient’s preferences, values, prior experience, beliefs, confidentiality and privacy.

3.3.4 Demonstrate ability to communicate with patients, colleagues and families in amanner that encourages participation and shared decision-making.

3.4. Lifelong learner committed to continuous improvement of skills and knowledge

3.4.1. Demonstrate ability to perform an objective self-assessment of knowledge and skills, continue learning, refine existing skills and acquire new skills.

3.4.2. Demonstrate ability to apply newly gained knowledge or skills to the care of the patient.

3.4.3. Demonstrate ability to introspect and utilize experiences, to enhance personal and professional growth and learning.

3.4.4. Demonstrate ability to search (including through electronic means), and critically revaluate the medical literature and apply the information in the care of the patient.

3.4.5. Be able to identify and select an appropriate career pathway that is professionally rewarding and personally fulfilling.

3.5. *Professional who is committed to excellence, is ethical, responsive and accountable to patients, community and the profession*

3.5.1. Practice selflessness, integrity, responsibility, accountability and respect.

3.5.2. Respect and maintain professional boundaries between patients, colleagues and society.

3.5.3. Demonstrate ability to recognize and manage ethical and professional conflicts.

3.5.4. Abide by prescribed ethical and legal codes of conduct and practice.

3.5.5. Demonstrate a commitment to the growth of the medical profession as a whole.

Section 2

Subject-wise outcomes

Section 2 contains subject-wise outcomes so called “sub-competencies” that must be achieved at the end of instruction in that subject. These are organised in tables and have two parts. The core subject outcomes are in first part. The second part in the same document (titled Integration) contains outcomes/competencies in other subjects which have been identified by experts in those subjects as requiring alignment or integration with the core subject.

Outcomes (competencies) in each subject are grouped according to topics number-wise. It is important to review the individual outcomes (competencies) in the light of the topic outcomes as a whole. For each competency outlined - the learning domains (Knowledge, Skill, Attitude, Communication) are identified. The expected level of achievement in that subject is identified as – [knows (K), knows how (KH), shows how (SH), perform (P)]. As a rule, ‘perform’ indicates independent performance without supervision and is required rarely in the pre-internship period. The outcome is a core (Y - must achieve) or a non-core (N - desirable) outcome. Suggested learning and assessment methods (these are suggestions) and explanation of the terms used are given under the section “definitions used in this document”. The suggested number of times a skill must be performed independently for certification in the learner’s log book is also given. Last two columns indicate subjects within the same phase and other phases with which the topic can be taught - together - aligned (temporal coordination), shared, correlated or nested.

The number of topics and competencies in each subject are given below:

Topics & outcomes in Pre-clinical & Para-clinical subjects

Sr. No.	Subjects	Number of topics	Number of outcomes
1.	**Human Anatomy**	82	409
2.	**Physiology**	11	137
3.	**Biochemistry**	11	89
4.	**Pharmacology**	05	85
5.	**Pathology**	36	182
6.	**Microbiology**	08	54
7.	**Forensic Medicine & Toxicology**	14	162
	Total	**167**	**1118**

Topics & outcomes in Medicine and Allied subjects

Sr. No.	Subjects	Number of topics	Number of outcomes
1.	**Community Medicine**	20	107
2.	**General Medicine**	26	506
3.	**Respiratory Medicine**	02	47
4.	**Pediatrics**	35	406
5.	**Psychiatry**	19	117
6.	**Dermatology, Venereology & Leprosy**	18	73
7.	**Physical Medicine & Rehabilitation**	09	43
	Total	**129**	**1299**

Topics & outcomes in Surgery and Allied subjects

Sr. No.	Subjects	Number of topics	Number of outcomes
1.	**General Surgery**	30	133
2.	**Ophthalmology**	09	60
3.	**Otorhinolaryngology**	04	76
4.	**Obstetrics & Gynaecology**	38	126
5.	**Orthopedics**	14	39
6.	**Anesthesiology**	10	46
7.	**Radiodiagnosis**	01	13
8.	**Radiotherapy**	05	16
9.	**Dentistry**	05	23
	Total	**116**	**532**

Section 3

Sample topics used for alignment & integration

Section 3 contains a sample selection of topics that run across the phases which can be used for alignment and integration. These are suggestions and institutions can select their own set of topics which can run across phases.

It is important to design the curriculum with a view to ensure with several broad outcomes in mind: a) achievement of the broad competencies by the learner at the end of the MBBS program, b) retain the subject - wise character of learning and assessment and ensure that phase-wise subject outcomes are met and assessed, c) teaching topics that are similar together thereby reducing redundancy and allowing the learner to integrate the concept as the most important step in integration (alignment or temporal coordination) (see document on integration), and d) align learning and assessment experiences to the outcome and the level of achievement specified.

Understanding the competencies table

Understanding the competencies table

A	B	C	D	E	F	G	H	I	J
No.	**Competencies**	**Domain**	**K/KH/SH/P**	**Core**	**Suggested Teaching Learning Method**	**Suggested Assessment method**	**No. required to certify (P)**	**Vertical Integration**	**Horizontal Integration**
Physiology									
Summary **Name of Topic: General Physiology** **Number of Competencies: (08)**									
PY1.1	Describe the structure and functions of a	K	KH	Y	Lectures, Small group discussion	Written/Viva			Biochemistry
IM25.4	Elict *document* and present a medical history that helps delineate the	S	SH	Y	Bed Side clinic, DOAP	Skill assessment		Community Medicine	

Unique number of the competency. First two alphabets represent the subject (see list); number following alphabet reflects topic number, following period is a running number.

Description of competency

Identifies the domain or domains addressed
K - Knowledge
S - Skill
A - Attitude
C - Communication

Identifies the level of competency required based on the Miller's pyramid
K - Knows
KH - Knows How
S - Skill
SH - Show How
P - Perform independently

Identifies if the competency is core or desirable.
Y indicates Core; N-non-core

Identifies the suggested learning method.
DOAP - **D**emonstrate (by Student) Observe, Assist Perform)

Identifies the suggested assessment method
Skill assessment - Clinics, Skills lab, Practicals etc.

no of times a skill needs to be done independently to be certified for independent performance; Rarely used in UG

Subject (s) in other phases with which the competency can be vertically integrated to increase relevance or improve basic understanding

Subject (s) in the same phase with which the competency can be horizontally integrated or aligned to allow a more wholesome understanding

***Numbers given are for illustrative purposes only and should not be compared with the same in curriculum documents**

Deriving learning objectives from competencies

Deriving learning objectives from competencies

K	Knows	A knowledge attribute – Usually enumerates or describes
KH	Knows how	A higher level of knowledge – is able to discuss or analyse
S	Shows	A skill attribute: is able to identify or demonstrate the steps
SH	Shows how	A skill attribute: is able to interpret / demonstrate a complex procedure requiring thought, knowledge and behaviour
P	Performs (under supervision or independently)	Mastery for the level of competence - When done independently under supervision a pre-specified number of times - certification or capacity to perform independently results

Competency: An **observable** ability of a health professional, **integrating multiple components** such as knowledge, skills, values and attitudes.

PA42.3*	**Identify the etiology of meningitis based on given CSF parameters**	**K/S**	**SH**	**Y**

PA42.1*	At the end of the session the **phase II student** must be able to enumerate the most common causes of meningitis correctly
PA42.2*	At the end of the session the **phase II student** must be able to enumerate the components of CSF analysis correctly
PA42.3*	At the end of the session the **phase II student** must be able to **describe** the CSF features for a given etiology of meningitis **accurately**
PA42.4*	At the end of the session the **phase II student** must be able to identify the aetiology of meningitis correctly from a **given set of CSF parameters**

Audience - who will do the behavior

Behavior - What should the learner be able to do?

Condition - Under what conditions should the learner be able to do it?

Degree – How well must it be done

Objective: Statement of what a learner should be able to do at the end of a specific learning experience
***Numbers given are for illustrative purposes only and should not be compared with the same in curriculum documents**

Deriving learning methods from competencies

Deriving learning methods from competencies

Competency: An **observable** ability of a health professional, **integrating multiple components** such as knowledge, skills, values and attitudes.

PA42.3*	**Identify** the etiology of meningitis based on given CSF parameters	K/S	SH	Y

Objective: Statement of what a learner should be able to do at the end of a specific learning experience

PA42.1*	At the end of the session the **Phase II student** must be able to enumerate the most common causes of meningitis **correctly**
PA42.2*	At the end of the session the **Phase II student** must be able to enumerate the components of a CSF analysis correctly
PA42.3*	At the end of the session the **Phase II student** must be able to **describe** the CSF features for a given etiologic of meningitis **accurately**
PA42.4*	At the end of the session the **Phase II student** must the able to identify the aetiology of meningitis correctly from a **given set of CSF parameters**

Lecture or small group discussion

Related objectives can be combined into one teaching session

small group discussion, practical session

*Numbers given are for illustrative purposes only and should not be compared with the same in curriculum documents

Deriving assessment methods from competencies

Deriving assessment methods from competencies-1

Competency: An **observable** ability of a health professional, **integrating multiple components** such as knowledge, skills, values and attitudes.

PA42.3*	**Identify** the etiology of meningitis based on given CSF parameters	K/S	SH	Y

Objective: Statement of what a learner should be able to do at the end of a specific learning experience

PA42.1*	At the end of the session the Phase II student must be able to enumerate the most common causes of meningitis correctly	Short note or part of structured essay: Enumerate 5 causes of meningitis based on their prevalence in India
PA42.2*	At the end of the session the **Phase II student** must be able to enumerate the components of a CSF analysis correctly	Short note or part of structured essay: Enumerate the components tested in a CSF analysis
PA42.3*	At the end of the session the **Phase II student** must be able to **describe** the CSF features for a given aetiology of meningitis a**ccurately**	Short note or part of structured essay: Describe the CSF findings that are characteristic of tuberculous meningitis
PA42.4*	At the end of the session the **Phase II student** must the able to identify the aetiology of meningitis correctly from a **given set of CSF parameters**	Short note / part of the structured essay/ Skill station/ Viva voce Review the CSF findings in the following patient and identify (write or vocalise) the most likely etiology

*** Numbers given are for illustrative purposes only and should not be compared with numbers in the curriculum document**

Deriving assessment methods from competencies-2

Competency: An **observable** ability of a health professional, **integrating multiple components** such as knowledge, skills, values and attitudes.

MI2.4*	List the common microbial agents causing anemia. Describe the morphology, mode of infection and discuss the pathogenesis, clinical course, diagnosis and prevention and treatment of the common microbial agents causing Anemia.	K	KH	Y	Didactic Small group discussion	Written/ Viva voce	Medicine	Pathology

Objective: Statement of what a learner should be able to do at the end of a specific learning experience

MI2.1*	Enumerate the common microbial agents causing anaemia
MI2.2*	Describe the morphology of agent (1,2 etc)
MI2.3*	Describe the mode of infection of agent in humans
MI2.4*	Discuss the pathogenesis of anemia caused by agent
MI2.5*	Describe the clinical course of infection by agent
MI2.6*	Enumerate the diagnostic tests to identify the aetiology of agent as a cause of anemia
MI2.7*	Discuss the methods to prevent infection by agent
MI2.8*	Describe the treatment of infection by agent

Integrate concept - not necessarily teachers
Plan session with teachers of both subjects -teachers from both subjects usually not needed. Ensure redundancy and duplication by reviewing both subjects

Horizontally aligned and integrated with pathology

Vertically integrated with General Medicine

Integrate concept - not necessarily teachers Plan session with teachers from both phases. Make a decision on how much of the information needs to be brought down to this phase to make it relevant. Consider how a competency can ascend over phases: for eg. - can be at a KH -(know how) in phase II but becomes SH in phase III. For vertical integration with clinical subjects, use of a case to link the concept (a well written paper, case is sufficient). Using teachers from both phases is rarely required

The concept of integration

Concept of integration used in the Manual

Integration is a learning experience that allows the learner to perceive relationships from blocks of knowledge and develop a unified view of its basis and its application. The GMR 2018 applies these principles to the extent that will retain the strengths of silo - based education and assessment while providing experiences that will allow learners to integrate concepts.

Keeping this in mind, the Regulations recommend temporal coordination as described by Harden (called alignment in this document) as the major method to be followed allowing similar topics in different subjects to be thought separately but during the same time frame (Figure 1a).

In a small proportion - not to exceed 20% of the total curriculum an attempt can be made to Share (Figure 1b) topics or Correlate (Figure 1c) topics by using an integration session. The integration session most preferred will be a case based discussion in an appropriate format ensuring that elements in the same phase (horizontal) and from other phases are addressed. Care must be taken to ensure that achievement phase - based objectives are given primacy - the integrative elements from other phases are used only to provide adequate recall and understand the clinical application of concepts. It must be emphasized that integration does not necessarily require multiple teachers in each class. Experts from each phase and subject may be involved in the lesson planning but not it in its delivery unless deemed necessary.

As much as possible the necessary correlates from other phases must also be introduced while discussing a topic in a given subject - Nesting (Figure 1d) (Harden). Topics that cannot be aligned and integrated must be provided adequate time in the curriculum throughout the year.

Assessment will continue to be subject based. However, efforts must be made to ensure that phase appropriate correlates are tested to determine if the learner has internalized and integrated the concept and its application.

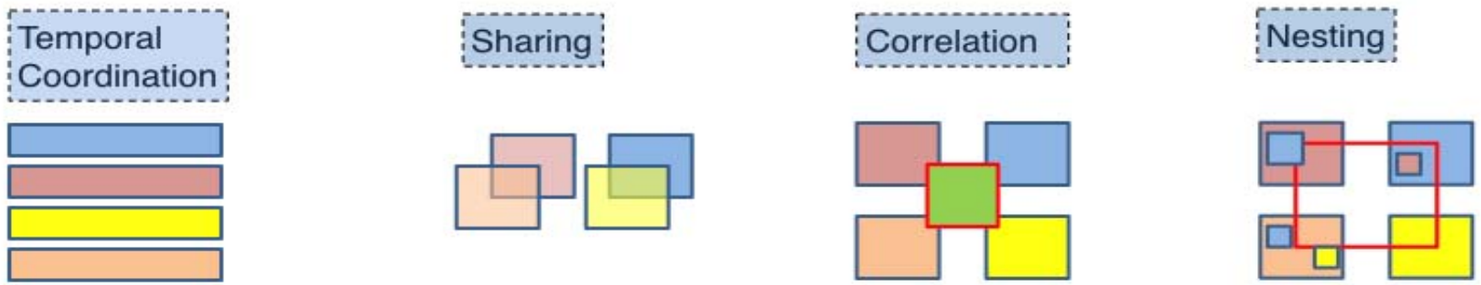

Figure 1 : Integration concepts framed in the GMR. Coloured boxes represent subjects. 1 a. Temporal coordination: The timetable is adjusted so that topics within the subjects or disciplines which are related, are scheduled at the same time. b. Sharing: Two disciplines may agree to plan and jointly implement a teaching program c. Correlation: the emphasis remains on disciplines or subjects with subject-based courses taking up most of the curriculum time. Within this framework, an integrated teaching session or course is introduced in addition to the subject-based teaching (green box with red border) d. Nesting: the teacher targets, within a subject-based course, skills relating to other subjects. Adapted from Harden R Med Edu 2000. 34; 551

Definitions used in the Manual

1. **Goal:** A projected state of affairs that a person or system plans to achieve.

   In other words: Where do you want to go? or What do you want to become?

2. **Competency:** The habitual and judicious use of communication, knowledge, technical skills, clinical reasoning, emotions, values, and reflection in daily practice for the benefit of the individual and community being served.

   In other words: What should you have? or What should have changed?

3. **Objective:** Statement of what a learner should be able to do at the end of a specific learning experience.

   In other words: What the Indian Medical Graduate should know, do, or behave.

Action Verbs used in this manual

Knowledge	**Skill**	**Attitude/communicate**
Enumerate	Identify	Counsel
List	Demonstrate	Inform
Describe	Perform under supervision	Demonstrate understanding of
Discuss	Perform independently	
Differentiate	Document	
Define	Present	
Classify	Record	
Choose	Interpret	
Elicit		
Report		

Note:

1. Specified essential competencies only will be required to be performed independently at the end of the final year MBBS.
2. The word ‘perform’ or ‘do’ is used ONLY if the task has to be done on patients or in laboratory practical in the pre/para- clinical phases.
3. Most tasks that require performance during undergraduate years will be performed under supervision.
4. If a certification to perform independently has been done, then the number of times the task has to be performed under supervision will be indicated in the last column.

Explanation of terms used in this manual

Lecture	Any instructional large group method including traditional lecture and interactive lecture
Small group discussion	Any instructional method involving small groups of students in an appropriate learning context
DOAP (Demonstration-Observation - Assistance - Performance)	A practical session that allows the student to observe a demonstration, assist the performer, perform in a simulated environment, perform under supervision or perform independently
Skill assessment	A session that assesses the skill of the student including those in the practical laboratory, skills lab, skills station that uses mannequins/ paper case/simulated patients/real patients as the context demands
Core	A competency that is necessary in order to complete the requirements of the subject (traditional must know)
Non-Core	A competency that is optional in order to complete the requirements of the subject (traditional nice (good) to know/ desirable to know)
National Guidelines	Health programs as relevant to the competency that are part of the National Health Program

Domains of learning

K	Knowledge
S	Skill
A	Attitude
C	Communication

Levels of competency

K	Knows	A knowledge attribute - Usually enumerates or describes
KH	Knows how	A higher level of knowledge - is able to discuss or analyze
S	Shows	A skill attribute: is able to identify or demonstrate the steps
SH	Shows how	A skill attribute: is able to interpret/ demonstrate a complex procedure requiring thought, knowledge and behavior
P	Performs (under supervision or independently)	Mastery for the level of competence - When done independently under supervision a pre-specified number of times - certification or capacity to perform independently results

Note:

In the table of competency - the highest level of competency acquired is specified and implies that the lower levels have been acquired already. Therefore, when a student is able to SH - Show how - an informed consent is obtained - it is presumed that the preceding steps - the knowledge, the analytical skills, the skill of communicating have all been obtained.

It may also be noted that attainment of the highest level of competency may be obtained through steps spread over several subjects or phases and not necessarily in the subject or the phase in which the competency has been identified.

Volume II

Competency based Undergraduate Curriculum

in

Medicine and Allied subjects

COMMUNITY MEDICINE (CODE: CM)

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/N	Suggested Teaching learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
COMMUNITY MEDICINE									
Topic: Concept of Health and Disease		**Number of competencies: (10)**			**Number of procedures that require certification:(NIL)**				
CM1.1	Define and describe the concept of Public Health	K	KH	Y	Lecture, Small group discussion	Written / Viva voce			
CM1.2	Define health; describe the concept of holistic health including concept of spiritual health and the relativeness & determinants of health	K	KH	Y	Lecture, Small group discussion	Written / Viva voce			
CM1.3	Describe the characteristics of agent, host and environmental factors in health and disease and the multi factorial etiology of disease	K	KH	Y	Lecture, Small group discussion	Written / Viva voce			
CM1.4	Describe and discuss the natural history of disease	K	KH	Y	Lecture, Small group discussion	Written / Viva voce			
CM1.5	Describe the application of interventions at various levels of prevention	K	KH	Y	Lecture, Small group discussion	Written / Viva voce			
CM1.6	Describe and discuss the concepts, the principles of Health promotion and Education, IEC and Behavioral change communication (BCC)	K	KH	Y	Lecture, Small group discussion	Written / Viva voce			
CM1.7	Enumerate and describe health indicators	K	KH	Y	Lecture, Small group discussion	Written / Viva voce			
CM1.8	Describe the Demographic profile of India and discuss its impact on health	K	KH	Y	Lecture, Small group discussion	Written / Viva voce			
CM1.9	Demonstrate the role of effective Communication skills in health in a simulated environment	S	SH	Y	DOAP sessions	Skill Assessment		AETCOM	
CM1.10	Demonstrate the important aspects of the doctor patient relationship in a simulated environment	S	SH	Y	DOAP sessions	Skill Assessment		AETCOM	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/N	Suggested Teaching learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
Topic: Relationship of social and behavioural to health and disease		**Number of competencies: (5)**			**Number of procedures that require certification: (NIL)**				
CM2.1	Describe the steps and perform clinico socio-cultural and demographic assessment of the individual, family and community	S	SH	Y	Lecture, Small group discussion, DOAP session	Written / Viva voce/ Skill assessment			
CM2.2	Describe the socio-cultural factors, family (types), its role in health and disease & demonstrate in a simulated environment the correct assessment of socio-economic status	S	SH	Y	Lecture, Small group discussion, DOAP session	Written / Viva voce/ Skill assessment			
CM2.3	Describe and demonstrate in a simulated environment the assessment of barriers to good health and health seeking behavior	S	SH	Y	Lecture, Small group discussion, DOAP session	Written / Viva voce/ Skill assessment			
CM2.4	Describe social psychology, community behaviour and community relationship and their impact on health and disease	K	KH	Y	Lecture, Small group discussion	Written / Viva voce			
CM2.5	Describe poverty and social security measures and its relationship to health and disease	K	KH	Y	Lecture, Small group discussion	Written / Viva voce			
Topic: Environmental Health Problems		**Number of competencies: (8)**			**Number of procedures that require certification: (NIL)**				
CM3.1	Describe the health hazards of air, water, noise, radiation and pollution	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		General Medicine, ENT	
CM3.2	Describe concepts of safe and wholesome water, sanitary sources of water, water purification processes, water quality standards, concepts of water conservation and rainwater harvesting	K	KH	Y	Lecture, Small group discussion, DOAP session	Written / Viva voce			
CM3.3	Describe the aetiology and basis of water borne diseases /jaundice/hepatitis/ diarrheal diseases	K	KH	Y	Lecture, Small group discussion, DOAP session	Written / Viva voce		Microbiology, General Medicine, Pediatrics	
CM3.4	Describe the concept of solid waste, human excreta and sewage disposal	K	KH	Y	Lecture, Small group discussion	Written / Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/N	Suggested Teaching learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
CM3.5	Describe the standards of housing and the effect of housing on health	K	KH	Y	Lecture, Small group discussion	Written / Viva voce			
CM3.6	Describe the role of vectors in the causation of diseases. Also discuss National Vector Borne disease Control Program	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		Microbiology	
CM3.7	Identify and describe the identifying features and life cycles of vectors of Public Health importance and their control measures	S	SH	Y	Lecture, Small group discussion, DOAP session	Written / Viva voce/ Skill assessment		Microbiology	
CM3.8	Describe the mode of action, application cycle of commonly used insecticides and rodenticides	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		Pharmacology	
Topic: Principles of health promotion and education **Number of competencies: (3)** **Number of procedures that require certification: (NIL)**									
CM4.1	Describe various methods of health education with their advantages and limitations	K	KH	Y	Lecture, Small group discussion	Written / Viva voce			
CM4.2	Describe the methods of organizing health promotion and education and counselling activities at individual family and community settings	K	KH	Y	Lecture, Small group discussion	Written / Viva voce			
CM4.3	Demonstrate and describe the steps in evaluation of health promotion and education program	S	SH	Y	Small group session, DOAP session	Written / Viva voce/ Skill assessment			
Topic: Nutrition **Number of competencies: (08)** **Number of procedures that require certification: (NIL)**									
CM5.1	Describe the common sources of various nutrients and special nutritional requirements according to age, sex, activity, physiological conditions	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		General Medicine, Pediatrics	
CM5.2	Describe and demonstrate the correct method of performing a nutritional assessment of individuals, families and the community by using the appropriate method	S	SH	Y	DOAP sessions	Skill Assessment		General Medicine, Pediatrics	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/N	Suggested Teaching learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
CM5.3	Define and describe common nutrition related health disorders (including macro-PEM, Micro-iron, Zn, iodine, Vit. A), their control and management	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		General Medicine, Pediatrics	
CM5.4	Plan and recommend a suitable diet for the individuals and families based on local availability of foods and economic status, etc in a simulated environment	S	SH	Y	DOAP sessions	Skill Assessment		General Medicine, Pediatrics	
CM5.5	Describe the methods of nutritional surveillance, principles of nutritional education and rehabilitation in the context of socio-cultural factors.	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		General Medicine, Pediatrics	
CM5.6	Enumerate and discuss the National Nutrition Policy, important national nutritional Programs including the Integrated Child Development Services Scheme (ICDS) etc	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		Pediatrics	
CM5.7	Describe food hygiene	K	KH	Y	Lecture, Small group discussion	Written / Viva voce			Microbiology
CM5.8	Describe and discuss the importance and methods of food fortification and effects of additives and adulteration	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		Pediatrics	
Topic: Basic statistics and its applications		**Number of competencies: (04)**				**Number of procedures that require certification: (NIL)**			
CM6.1	Formulate a research question for a study	K	KH	Y	Small group discussion, Lecture, DOAP sessions	Written / Viva voce/ Skill assessment		General Medicine, Pediatrics	
CM6.2	Describe and discuss the principles and demonstrate the methods of collection, classification, analysis, interpretation and presentation of statistical data	S	SH	Y	Small group, Lecture, DOAP sessions	Written / Viva voce/ Skill assessment		General Medicine, Pediatrics	
CM6.3	Describe, discuss and demonstrate the application of elementary statistical methods including test of significance in various study designs	S	SH	Y	Small group discussion, Lecture, DOAP sessions	Written / Viva voce/ Skill assessment		General Medicine, Pediatrics	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/N	Suggested Teaching learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
CM6.4	Enumerate, discuss and demonstrate Common sampling techniques, simple statistical methods, frequency distribution, measures of central tendency and dispersion	S	SH	Y	Small group discussion, Lecture, DOAP sessions	Written / Viva voce/ Skill assessment		General Medicine, Pediatrics	
Topic: Epidemiology		**Number of competencies: (09)**			**Number of procedures that require certification: (NIL)**				
CM7.1	Define Epidemiology and describe and enumerate the principles, concepts and uses	K	KH	Y	Small group discussion, Lecture	Written / Viva voce		General Medicine	
CM7.2	Enumerate, describe and discuss the modes of transmission and measures for prevention and control of communicable and non-communicable diseases	K	KH	Y	Small group discussion, Lecture	Written / Viva voce		General Medicine	
CM7.3	Enumerate, describe and discuss the sources of epidemiological data	K	KH	Y	Small group discussion, Lecture	Written / Viva voce		General Medicine	
CM7.4	Define, calculate and interpret morbidity and mortality indicators based on given set of data	S	SH	Y	Small group, DOAP sessions	Written/ Skill assessment		General Medicine	
CM7.5	Enumerate, define, describe and discuss epidemiological study designs	K	KH	Y	Small group discussion, Lecture	Written / Viva voce		General Medicine	
CM7.6	Enumerate and evaluate the need of screening tests	S	SH	Y	Small group discussion, DOAP sessions	Written/ Skill assessment		General Medicine	
CM7.7	Describe and demonstrate the steps in the Investigation of an epidemic of communicable disease and describe the principles of control measures	S	SH	Y	Small group discussion, DOAP sessions	Written/ Skill assessment		General Medicine	Microbiology
CM7.8	Describe the principles of association, causation and biases in epidemiological studies	K	KH	Y	Small group discussion, Lecture	Written / Viva voce		General Medicine	
CM7.9	Describe and demonstrate the application of computers in epidemiology	S	KH	Y	Small group discussion, DOAP sessions	Written			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/N	Suggested Teaching learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
Topic: Epidemiology of communicable and non- communicable diseases		**Number of competencies:(7)**				**Number of procedures that require certification:(NIL)**			
CM8.1	Describe and discuss the epidemiological and control measures including the use of essential laboratory tests at the primary care level for communicable diseases	K	KH	Y	Small group discussion, Lecture	Written / Viva voce		General Medicine, Pediatrics	Microbiology, Pathology
CM8.2	Describe and discuss the epidemiological and control measures including the use of essential laboratory tests at the primary care level for Non Communicable diseases (diabetes, Hypertension, Stroke, obesity and cancer etc.)	K	KH	Y	Small group discussion, Lecture	Written / Viva voce		General Medicine	
CM8.3	Enumerate and describe disease specific National Health Programs including their prevention and treatment of a case	K	KH	Y	Small group discussion, Lecture	Written / Viva voce		General Medicine, Pediatrics	
CM8.4	Describe the principles and enumerate the measures to control a disease epidemic	K	KH	Y	Small group discussion, Lecture	Written / Viva voce		General Medicine, Pediatrics	
CM8.5	Describe and discuss the principles of planning, implementing and evaluating control measures for disease at community level bearing in mind the public health importance of the disease	K	KH	Y	Small group discussion, Lecture	Written / Viva voce		General Medicine, Pediatrics	
CM8.6	Educate and train health workers in disease surveillance, control & treatment and health education	S	SH	Y	DOAP sessions	Skill assessment			
CM8.7	Describe the principles of management of information systems	K	KH	Y	Small group discussion, Lecture	Written / Viva voce			
Topic: Demography and vital statistics		**Number of competencies: (07)**				**Number of procedures that require certification: (NIL)**			
CM9.1	Define and describe the principles of Demography, Demographic cycle, Vital statistics	K	KH	Y	Small group discussion, Lecture	Written / Viva voce			
CM9.2	Define, calculate and interpret demographic indices including birth rate, death rate, fertility rates	S	SH	Y	Lecture, Small group discussion, DOAP sessions	Skill assessment		Obstetrics & Gynaecology, Pediatrics	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/N	Suggested Teaching learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
CM9.3	Enumerate and describe the causes of declining sex ratio and its social and health implications	K	KH	Y	Small group discussion, Lecture	Written / Viva voce			
CM9.4	Enumerate and describe the causes and consequences of population explosion and population dynamics of India.	K	KH	Y	Small group discussion, Lecture	Written / Viva voce			
CM9.5	Describe the methods of population control	K	KH	Y	Small group discussion, Lecture	Written / Viva voce		Obstetrics & Gynaecology	
CM9.6	Describe the National Population Policy	K	KH	Y	Small group discussion, Lecture	Written / Viva voce			
CM9.7	Enumerate the sources of vital statistics including census, SRS, NFHS, NSSO etc	K	KH	Y	Small group discussion, Lecture	Written / Viva voce			
Topic: Reproductive maternal and child health		**Number of competensies:(09)**				**Number of procedures that require certification: (NIL)**			
CM10.1	Describe the current status of Reproductive, maternal, newborn and Child Health	K	KH	Y	Small group discussion, Lecture	Written / Viva voce		Obstetrics & Gynaecology, Pediatrics	
CM10.2	Enumerate and describe the methods of screening high risk groups and common health problems	K	KH	Y	Small group discussion, Lecture	Written / Viva voce		Pediatrics, Obstetrics & Gynaecology	
CM10.3	Describe local customs and practices during pregnancy, childbirth, lactation and child feeding practices	K	KH	Y	Small group discussion, Lecture	Written / Viva voce		Pediatrics, Obstetrics & Gynaecology	
CM10.4	Describe the reproductive, maternal, newborn & child health (RMCH); child survival and safe motherhood interventions	K	KH	Y	Small group discussion, Lecture	Written / Viva voce		Obstetrics & Gynaecology, Pediatrics	
CM10.5	Describe Universal Immunization Program; Integrated Management of Neonatal and Childhood Illness (IMNCI) and other existing Programs.	K	KH	Y	Small group discussion, Lecture	Written / Viva voce		Pediatrics	
CM10.6	Enumerate and describe various family planning methods, their advantages and shortcomings	K	KH	Y	Small group discussion, Lecture	Written / Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/N	Suggested Teaching learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
CM10.7	Enumerate and describe the basis and principles of the Family Welfare Program including the organization, technical and operational aspects	K	KH	Y	Small group discussion, Lecture	Written / Viva voce			
CM10.8	Describe the physiology, clinical management and principles of adolescent health including ARSH	K	KH	Y	Small group discussion, Lecture	Written / Viva voce			
CM10.9	Describe and discuss gender issues and women empowerment	K	KH	Y	Small group discussion, Lecture	Written / Viva voce			
Topic: Occupational Health		**Number of competencies: (05)**				**Number of procedures that require certification: (NIL)**			
CM11.1	Enumerate and describe the presenting features of patients with occupational illness including agriculture	K	KH	Y	Small group discussion, Lecture	Written / Viva voce			
CM11.2	Describe the role, benefits and functioning of the employees state insurance scheme	K	KH	Y	Small group discussion, Lecture	Written / Viva voce			
CM11.3	Enumerate and describe specific occupational health hazards, their risk factors and preventive measures	K	KH	Y	Small group discussion, Lecture	Written / Viva voce			
CM11.4	Describe the principles of ergonomics in health preservation	K	KH	Y	Small group discussion, Lecture	Written / Viva voce			
CM11.5	Describe occupational disorders of health professionals and their prevention & management	K	KH	Y	Small group discussion, Lecture	Written / Viva voce			
Topic: Geriatric services		**Number of competencies: (04)**				**Number of procedures that require certification: (NIL)**			
CM12.1	Define and describe the concept of Geriatric services	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		General Medicine	
CM12.2	Describe health problems of aged population	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		General Medicine	
CM12.3	Describe the prevention of health problems of aged population	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		General Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/N	Suggested Teaching learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
CM12.4	Describe National program for elderly	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		General Medicine	
Topic: Disaster Management		**Number of competencies: (04)**				**Number of procedures that require certification: (NIL)**			
CM13.1	Define and describe the concept of Disaster management	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		General Surgery, General Medicine	
CM13.2	Describe disaster management cycle	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		General Surgery, General Medicine	
CM13.3	Describe man made disasters in the world and in India	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		General Surgery, General Medicine	
CM13.4	Describe the details of the National Disaster management Authority	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		General Surgery, General Medicine	
Topic: Hospital waste management		**Number of competencies: (03)**				**Number of procedures that require certification: (NIL)**			
CM14.1	Define and classify hospital waste	K	KH	Y	Lecture, Small group discussion, visit to hospital	Written / Viva voce			Microbiology
CM14.2	Describe various methods of treatment of hospital waste	K	KH	Y	Lecture, Small group discussion, visit to hospital	Written / Viva voce			Microbiology
CM14.3	Describe laws related to hospital waste management	K	KH	Y	Lecture, Small group discussion	Written / Viva voce			Microbiology
Topic: Mental Health		**Number of competencies: (03)**				**Number of procedures that require certification: (NIL)**			
CM15.1	Define and describe the concept of mental Health	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		Psychiatry	
CM15.2	Describe warning signals of mental health disorder	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		Psychiatry	
CM15.3	Describe National Mental Health program	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		Psychiatry	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/N	Suggested Teaching learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
Topic: Health planning and management		**Number of competencies: (04)**			**Number of procedures that require certification: (NIL)**				
CM16.1	Define and describe the concept of Health planning	K	KH	Y	Lecture, Small group discussion	Written / Viva voce			
CM16.2	Describe planning cycle	K	KH	Y	Lecture, Small group discussion	Written / Viva voce			
CM16.3	Describe Health management techniques	K	KH	Y	Lecture, Small group discussion	Written / Viva voce			
CM16.4	Describe health planning in India and National policies related to health and health planning	K	KH	Y	Lecture, Small group discussion	Written / Viva voce			
Topic: Health care of the communtiy		**Number of competencies:(05)**			**Number of procedures that require certification: (NIL)**				
CM17.1	Define and describe the concept of health care to community	K	KH	Y	Lecture, Small group discussion	Written / Viva voce			
CM17.2	Describe community diagnosis	K	KH	Y	Lecture, Small group discussion	Written / Viva voce			
CM17.3	Describe primary health care, its components and principles	K	KH	Y	Lecture, Small group discussion	Written / Viva voce			
CM17.4	Describe National policies related to health and health planning and millennium development goals	K	KH	Y	Lecture, Small group discussion	Written / Viva voce			
CM17.5	Describe health care delivery in India	K	KH	Y	Lecture, Small group discussion	Written / Viva voce			
Topic: International Health		**Number of competencies: (2)**			**Number of procedures that require certionat(NIL)**				
CM18.1	Define and describe the concept of International health	K	KH	Y	Lecture, Small group discussion	Written / Viva voce			
CM18.2	Describe roles of various international health agencies	K	KH	Y	Lecture, Small group discussion	Written / Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/N	Suggested Teaching learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
Topic: Essential Medicine	**Number of competencies: (3)**				**Number of procedures that require certification: (NIL)**				
CM19.1	Define and describe the concept of Essential Medicine List (EML)	K	KH	Y	Lecture, Small group discussion	Written / Viva voce			Pharmacology
CM19.2	Describe roles of essential medicine in primary health care	K	KH	Y	Lecture, Small group discussion	Written / Viva voce			Pharmacology
CM19.3	Describe counterfeit medicine and its prevention	K	KH	Y	Lecture, Small group discussion	Written / Viva voce			Pharmacology
Topic: Recent advances in Community Medicine	**Number of competencies: (04)**				**Number of procedures that require certification: (NIL)**				
CM20.1	List important public health events of last five years	K	KH	Y	Lecture, Small group discussion	Written / Viva voce			
CM20.2	Describe various issues during outbreaks and their prevention	K	KH	Y	Lecture, Small group discussion	Written / Viva voce			
CM 20.3	Describe any event important to Health of the Community	K	KH	Y	Lecture, Small group discussion	Written / Viva voce			
CM 20.4	Demonstrate awareness about laws pertaining to practice of medicine such as Clinical establishment Act and Human Organ Transplantation Act and its implications	K	KH	Y	Lecture, Small group discussion	Written / Viva voce			
	Column C: K- Knowledge, S – Skill, A - Attitude / professionalism, C- Communication. **Column D: K – Knows, KH - Knows How, SH - Shows how, P- performs independently,** **Column F: DOAP session – Demonstrate, Observe, Assess, Perform.** **Column H: If entry is P: indicate how many procedures must be done independently for certification/ graduation**								
Intergration									
	Physiology								
PY9.6	Enumerate the contraceptive methods for male and female. Discuss their advantages & disadvantages	K	KH	Y	Lectures, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology, Community Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/N	Suggested Teaching learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
Biochemistry									
BI8.5	Summarize the nutritional importance of commonly used items of food including fruits and vegetables.(macro-molecules & its importance)	K	KH	Y	Lectures, Small group discussions	Written/ Viva voce		Community Medicine, General Medicine, Pediatrics	
Pathology									
PA12.1	Enumerate and describe the pathogenesis of disorders caused by air pollution, tobacco and alcohol	K	KH	Y	Lecture, Small group discussion	Written / Viva voce			Community Medicine
PA26.5	Define and describe the etiology, types, exposure, environmental influence, pathogenesis, stages, morphology, microscopic appearance and complications of Occupational lung disease	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		General Medicine, Community Medicine	
PA26.7	Define and describe the etiology, types, exposure, genetics environmental influence, pathogenesis, morphology, microscopic appearance and complications of mesothelioma	K	KH	N	Lecture, Small group discussion	Written / Viva voce		General Medicine, Community Medicine	
Microbiology									
MI1.3	Describe the epidemiological basis of common infectious diseases	K	KH	Y	Lecture	Written/ Viva voce			Community Medicine
MI8.4	Describe the etiologic agents of emerging Infectious diseases. Discuss the clinical course and diagnosis	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		General Medicine, Community Medicine	Community Medicine
MI8.5	Define Healthcare Associated Infections (HAI) and enumerate the types. Discuss the factors that contribute to the development of HAI and the methods for prevention	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Community Medicine	
MI8.6	Describe the basics of Infection control	K	KH	Y	Lecture, Small group discussion	Written / Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/N	Suggested Teaching learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
MI8.7	Demonstrate Infection control practices and use of Personal Protective Equipments (PPE)	S	P	Y	DOAP session	Skill assessment	3 each in (Hand hygiene & PPE)	General Surgery	Community Medicine
MI8.16	Describe the National Health Programs in the prevention of common infectious disease (for information purpose only as taught in CM)	K	K	Y	Lecture	Written / Viva voce			
Pharmacology									
PH1.55	Describe and discuss the following National Health programmes including Immunisation, Tuberculosis, Leprosy, Malaria, HIV, Filaria, Kala Azar, Diarrhoeal diseases, Anaemia & nutritional disorders, Blindness, Non-communicable diseases, Cancer and Iodine deficiency	K	KH	Y	Lecture	Written / Viva voce			Community Medicine
Forensic Medicine & Toxicology									
FM2.33	Demonstrate ability to use local resources whenever required like in mass disaster situations	A & C	KH	Y	Lecture, Small group discussions	Written/ Viva voce		Community Medicine	
Dermatology, Venereology & Leprosy									
DR9.1	Classify, describe the epidemiology, etiology, microbiology pathogenesis and clinical presentations and diagnostic features of Leprosy	K	KH	Y	Lecture, Small group discussions	Written / Viva voce		General Medicine	Microbiology, Community Medicine
DR9.5	Enumerate the indications and describe the pharmacology, administration and adverse reaction of pharmacotherapies for various classes of leprosy based on national guidelines	K	KH	Y	Lecture, Small group discussions	Written / Viva voce		General Medicine	Pharmacology, Community Medicine
DR9.6	Describe the treatment of Leprosy based on the WHO guidelines	K	KH	Y	Lecture, Small group discussions	Written / Viva voce		General Medicine	Pharmacology, Community Medicine
Ophthalmology									
OP9.4	Enumerate, describe and discuss the causes of avoidable blindness and the National Programs for Control of Blindness (including vision 2020)	K	KH	Y	Lecture, Small group discussions	Written / Viva voce			Community Medicine

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/N	Suggested Teaching learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
Psychiatry									
PS19.1	Describe the relevance, role and status of community psychiatry	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		Community Medicine	
PS19.2	Describe the objectives strategies and contents of the of the National Mental Health Programme	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		Community Medicine	
PS19.4	Enumerate and describe the salient features of the prevalent mental health laws in India	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		Community Medicine	
PS19.5	Describe the concept and principles of preventive psychiatry and mental health promotion (positive mental health); and community education	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		Community Medicine	
General Medicine									
IM2.1	Discuss and describe the epidemiology, antecedents and risk factors for atherosclerosis and ischemic heart disease	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		Pathology, Physiology, Community Medicine	
IM4.3	Discuss and describe the common causes, pathophysiology and manifestations of fever in various regions in India including bacterial, parasitic and viral causes (e.g. Dengue, Chikungunya, Typhus)	K	K	Y	Lecture, Small group discussion	Written		Microbiology, Community Medicine	
IM9.15	Describe the national programs for anemia prevention	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		Pharmacology, Community Medicine	
IM12.12	Describe and discuss the iodisation programs of the government of India	K	KH	Y	Lecture, Bedside clinic	short note		Community Medicine	
IM14.4	Describe and discuss the impact of environmental factors including eating habits, food, work, environment and physical activity on the incidence of obesity	K	K	Y	Lectures, Small group discussions	short note/ Viva voce		Pathology, Community Medicine	
IM24.18	Describe the impact of the demographic changes in ageing on the population	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		Community Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/N	Suggested Teaching learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
IM25.1	Describe and discuss the response and the influence of host immune status, risk factors and comorbidities on zoonotic diseases (e.g. Leptospirosis, Rabies) and non-febrile infectious disease (e.g. Tetanus)	K	K	Y	Lecture, Small group discussion	Written		Microbiology, Community Medicine	
IM25.2	Discuss and describe the common causes, pathophysiology and manifestations of these diseases	K	K	Y	Lecture, Small group discussion	Written		Microbiology, Community Medicine	
IM25.4	Elicit document and present a medical history that helps delineate the aetiology of these diseases that includes the evolution and pattern of symptoms, risk factors, exposure through occupation and travel	S	SH	Y	Bedside clinic, DOAP session	Skill assessment		Community Medicine	
IM25.13	Counsel the patient and family on prevention of various infections due to environmental issues	C	SH	Y	DOAP session	Skill assessment		Community Medicine, General Medicine	
Obstetrics & Gynaecology									
OG1.1	Define and discuss birth rate, maternal mortality and morbidity	K	KH	Y	Lecture, Small group discussions	Short notes		Community Medicine	
OG1.2	Define and discuss perinatal mortality and morbidity including perinatal and neonatal mortality and morbidity audit	K	KH	Y	Lecture, Small group discussions	Short notes		Community Medicine	Pediatrics
OG8.1	Enumerate describe and discuss the objectives of antenatal care, assessment of period of gestation; screening for high-risk factors	K	KH	Y	Small group discussions, Bedside clinics, Lecture	Written / Viva voce/ Skill assessment		Community Medicine	
OG19.2	Counsel in a simulated environment, contraception and puerperal sterilisation	S/A/C	SH	Y	DOAP session	Skill assessment		Community Medicine	
OG21.1	Describe and discuss the temporary and permanent methods of contraception, indications, technique and complications; selection of patients, side effects and failure rate including OC, male contraception, emergency contraception and IUCD	K	KH	Y	Lecture, Small group discussions, Bedside clinics	Written / Viva voce/ Skill assessment		Community Medicine	
OG33.3	Describe and demonstrate the screening for cervical cancer in a simulated environment	K/S	SH	Y	DOAP session	Skill assessment		Community Medicine	
Pediatrics									

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/N	Suggested Teaching learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PE3.5	Discuss the role of the child developmental unit in management of developmental delay	K	K	N	Lecture, Small group discussion	Written/ Viva voce		Community Medicine	
PE3.7	Visit a Child Developmental unit and observe its functioning	S	KH	Y	Lecture, Small group discussion	Log book Entry		Community Medicine	
PE8.1	Define the term Complementary Feeding	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine	
PE8.2	Discuss the principles the initiation, attributes , frequency, techniques and hygiene related to complementary feeding including	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		Community Medicine	
PE8.3	Enumerate the common complimentary foods	K	K	Y	Lecture, Small group discussion	Written / Viva voce		Community Medicine	
PE8.4	Elicit history on the Complementary Feeding habits	S	SH	Y	Bedside clinics, Skills lab	Skill Assessment		Community Medicine	
PE8.5	Counsel and educate mothers on the best practices in Complimentary Feeding	A/C	SH	Y	DOAP session	Document in Log Book		Community Medicine	
PE9.1	Describe the age related nutritional needs of infants, children and adolescents including micronutrients and vitamins	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		Community Medicine, Biochemistry	
PE9.2	Describe the tools and methods for Assessment and classification of Nutritional status of infants, children and adolescents	K	KH	Y	Lecture, Small group discussion,	Written / Viva voce		Community Medicine	
PE9.4	Elicit, Document and present an appropriate nutritional history and perform a dietary recall	S	SH	Y	Bedside clinic, Skill Lab	Skill Assessment		Community Medicine	
PE9.5	Calculate the age related Calorie requirement in Health and Disease and identify gap	S	SH	Y	Bedside clinics, Small group discussion	Skill assessment		Community Medicine	
PE9.6	Assess and classify the nutrition status of infants, children and adolescents and recognize deviations	S	SH	Y	Bedside clinic, Small group discussion	Skill Assessment		Community Medicine	
PE9.7	Plan an appropriate diet in Health and disease	S	SH	N	Bedside clinic, Small group discussion	Document in logbook		Community Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/N	Suggested Teaching learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PE10.4	Identify children with under nutrition as per IMNCI criteria and plan referral	S	SH	Y	DOAP session	Document in log book		Community Medicine	
PE17.1	State the vision and outline the goals, strategies and plan of action of NHM and other important national programs pertaining to maternal and child health including RMNCH A+, RBSK, RKSK, JSSK mission Indradhanush and ICDS	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine	
PE17.2	Analyse the outcomes and appraise the monitoring and evaluation of NHM	K	KH	Y	Debate	Written/ Viva voce		Community Medicine	
PE18.1	List and explain the components, plans, outcomes of Reproductive child health (RCH) program and appraise the monitoring and evaluation	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		Community Medicine	Obstetrics & Gynaecology
PE18.2	Explain preventive interventions for Child survival and safe motherhood	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine	Obstetrics & Gynaecology
PE18.3	Conduct Antenatal examination of women independently and apply at-risk approach in antenatal care	S	SH	Y	Bedside clinics	Skill station		Community Medicine	Obstetrics & Gynaecology
PE18.4	Provide intra-natal care and conduct a normal Delivery in a simulated environment	S	SH	Y	DOAP session, Skills lab	Document in Log Book		Community Medicine	Obstetrics & Gynaecology
PE18.6	Perform Postnatal assessment of newborn and mother, provide advice on breast feeding, weaning and on family planning	S	SH	Y	Bedside clinics, Skill Lab	Skill Assessment		Community Medicine	Obstetrics & Gynaecology
PE18.8	Observe the implementation of the program by Visiting the Rural Health Centre	S	KH	Y	Bedside clinics, Skill Lab	Document in log book		Community Medicine	Obstetrics & Gynaecology
PE19.1	Explain the components of the Universal immunization Program and the sub National Immunization Programs	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine, Microbiology	
PE19.2	Explain the epidemiology of Vaccine preventable diseases	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine, Microbiology	
PE19.3	Vaccine description with regard to classification of vaccines, strain used, dose, route, schedule, risks, benefits and side effects, indications and contraindications	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine, Microbiology	
PE19.4	Define cold chain and discuss the methods of safe storage and handling of vaccines	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		Community Medicine, Microbiology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/N	Suggested Teaching learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PE19.5	Discuss immunization in special situations – HIV positive children, immunodeficiency, preterm , organ transplants, those who received blood and blood products, splenectomised children, Adolescents, travellers	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		Community Medicine, Microbiology	
PE19.8	Demonstrate willingness to participate in the National and sub national immunisation days	A	SH	Y	Lecture, Small group discussion	Document in Log Book		Community Medicine	
PE19.12	Observe the Administration the UIP vaccines	S	SH	Y	DOAP session	Document in Log Book		Community Medicine	
PE29.5	Discuss the National anaemia Control program	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		Community Medicine	
PE34.3	Discuss the various regimens for management of Tuberculosis as per National Guidelines	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology, Community Medicine, Pharmacology	Respiratory Medicine
PE34.4	Discuss the preventive strategies adopted and the objectives and outcome of the National Tuberculosis Control Program	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology, Community Medicine, Pharmacology	Respiratory Medicine
General Surgery									
SU7.1	Describe the Planning and conduct of Surgical audit	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		Community Medicine	
SU7.2	Describe the principles and steps of clinical research in surgery	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		Community Medicine	
Respiratory Medicine									
CT1.1	Describe and discuss the epidemiology of tuberculosis and its impact on the work, life and economy of India	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		Community Medicine	
CT1.4	Describe the epidemiology, the predisposing factors and microbial and therapeutic factors that determine resistance to drugs	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		Community Medicine, Microbiology, Pharmacology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/N	Suggested Teaching learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
CT1.15	Prescribe an appropriate antituberculosis regimen based on the location of disease, smear positivity and negativity and co-morbidities based on current national guidelines including directly observed tuberculosis therapy (DOTS)	K	SH	Y	Bedside clinic, Small group discussion, Lecture	Skill assessment		Pharmacology, Community Medicine	
CT1.16	Describe the appropriate precautions, screening, testing and indications for chemoprophylaxis for contacts and exposed health care workers	K	KH	Y	Bedside clinic, Small group discussion	Written		Community Medicine	
CT1.18	Educate health care workers on national programs of Tuberculosis and administering and monitoring the DOTS program	C	SH	Y	DOAP session	Skill assessment		Community Medicine	
CT2.24	Recognise the impact of OAD on patient's quality of life, well being, work and family	A	KH	Y	Small group discussion, Bedside clinic	Observation by faculty		Community Medicine	
CT2.25	Discuss and describe the impact of OAD on the society and workplace	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		Community Medicine	
CT2.26	Discuss and describe preventive measures to reduce OAD in workplaces	K	KH	Y	Lecture,Small group discussion	Written / Viva voce		Community Medicine	
CT2.27	Demonstrate an understanding of patient's inability to change working, living and environmental factors that influence progression of airway disease	A	KH	Y	Small group discussion, Bedside clinic	Observation by faculty		Community Medicine	

GENERAL MEDICINE (CODE: IM)

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
GENERAL MEDICINE									
Topic: Heart Failure		**Number of competencies: (30)**				**Number of procedures that require certification : (01)**			
IM1.1	Describe and discuss the epidemiology, pathogenesis clinical evolution and course of common causes of heart disease including: rheumatic/ valvular, ischemic, hypertrophic inflammatory	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM1.2	Describe and discuss the genetic basis of some forms of heart failure	K	KH	N	Lecture, Small group discussion	Written		Pathology, Physiology	
IM1.3	Describe and discuss the aetiology microbiology pathogenies and clinical evolution of rheumatic fever, criteria, degree of rheumatic activity and rheumatic valvular heart disease and its complications including infective endocarditis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology, Microbiology	
IM1.4	Stage heart failure	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM1.5	Describe ,discuss and differentiate the processes involved in R Vs L heart failure, systolic vs diastolic failure	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM1.6	Describe and discuss the compensatory mechanisms involved in heart failure including cardiac remodelling and neurohormonal adaptations	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM1.7	Enumerate, describe and discuss the factors that exacerbate heart failure including ischemia, arrythmias, anemia, thyrotoxicosis, dietary factors drugs etc.	K	KH	Y	Lecture,Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM1.8	Describe and discuss the pathogenesis and development of common arrythmias involved in heart failure particularly atrial fibrillation	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM1.9	Describe and discuss the clinical presentation and features, diagnosis, recognition and management of acute rheumatic fever	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Microbiology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
IM1.10	Elicit document and present an appropriate history that will establish the diagnosis, cause and severity of heart failure including: presenting complaints, precipitating and exacerbating factors, risk factors exercise tolerance, changes in sleep patterns, features suggestive of infective endocarditis	S	SH	Y	Bedside clinic	Skill assessment			
IM1.11	Perform and demonstrate a systematic examination based on the history that will help establish the diagnosis and estimate its severity including: measurement of pulse, blood pressure and respiratory rate, jugular venous forms and pulses, peripheral pulses, conjunctiva and fundus, lung, cardiac examination including palpation and auscultation with identification of heart sounds and murmurs, abdominal distension and splenic palpation	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			
IM1.12	Demonstrate peripheral pulse, volume, character, quality and variation in various causes of heart failure	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			
IM1.13	Measure the blood pressure accurately, recognise and discuss alterations in blood pressure in valvular heart disease and other causes of heart failure and cardiac tamponade	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			
IM1.14	Demonstrate and measure jugular venous distension	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			
IM1.15	Identify and describe the timing, pitch quality conduction and significance of precordial murmurs and their variations	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			
IM1.16	Generate a differential diagnosis based on the clinical presentation and prioritise it based on the most likely diagnosis	K	KH	Y	Bedside clinic, Small group discussion	Skill assessment			
IM1.17	Order and interpret diagnostic testing based on the clinical diagnosis including 12 lead ECG, Chest radiograph, blood cultures	K	SH	Y	Bedside clinic, DOAP session	Skill assessment			
IM1.18	Perform and interpret a 12 lead ECG	S	P	Y	Bedside clinic, DOAP session	Skill assessment	3		
IM1.19	Enumerate the indications for and describe the findings of heart failure with the following conditions including: 2D echocardiography, brain natriuretic peptide, exercise testing, nuclear medicine testing and coronary angiogram	S	KH	N	Lecture, Small group discussion, Bedside clinic	Skill assessment		Radiodiagnosis	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
IM1.20	Determine the severity of valvular heart disease based on the clinical and laboratory and imaging features and determine the level of intervention required including surgery	C	SH	Y	Small group discussion, Lecture, Bedside clinic	Written/ Skill assessment			
IM1.21	Describe and discuss and identify the clinical features of acute and subacute endocarditis, echocardiographic findings, blood culture and sensitivity and therapy	K	KH/SH	Y	Bedside clinic, Small group discussion, Lecture	Skill assessment			
IM1.22	Assist and demonstrate the proper technique in collecting specimen for blood culture	S	SH	Y	DOAP session	Skill assessment		Microbiology	
IM1.23	Describe, prescribe and communicate non pharmacologic management of heart failure including sodium restriction, physical activity and limitations	S/C	SH	Y	Lecture, Small group discussion	Skill assessment			
IM1.24	Describe and discuss the pharmacology of drugs including indications, contraindications in the management of heart failure including diuretics, ACE inhibitors, Beta blockers, aldosterone antagonists and cardiac glycosides	K	KH	Y	Lecture, Small group discussion	Viva voce/written		Pharmacology	
IM1.25	Enumerate the indications for valvuloplasty, valvotomy, coronary revascularization and cardiac transplantation	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Viva voce/written			
IM1.26	Develop document and present a management plan for patients with heart failure based on type of failure, underlying aetiology	S	SH	Y	Bedside clinic, Skill assessment, Small group discussion	Bedside clinic/ Skill assessment/written			
IM1.27	Describe and discuss the role of penicillin prophylaxis in the prevention of rheumatic heart disease	K	KH	Y	Bedside clinic, Small group discussion	Written		Microbiology, Pharmacology	
IM1.28	Enumerate the causes of adult presentations of congenital heart disease and describe the distinguishing features between cyanotic and acyanotic heart disease	K	KH	Y	Bedside clinic, Small group discussion	Bedside clinic/ Skill assessment/written			
IM1.29	Elicit document and present an appropriate history, demonstrate correctly general examination, relevant clinical findings and formulate document and present a management plan for an adult patient presenting with a common form of congenital heart disease	K	KH	Y	Bedside clinic,Small group discussion	Skill assessment/ written			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
IM1.30	Administer an intramuscular injection with an appropriate explanation to the patient	S	SH	Y	Bedside clinic, Skill assessment	Log book documentation of completion		Pharmacology	
Topic:	**Acute Myocardial Infarction/ IHD**	**Number of competencies: (24)**				**Number of procedures that require certification : (02)**			
IM2.1	Discuss and describe the epidemiology, antecedents and risk factors for atherosclerosis and ischemic heart disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology, Community Medicine	
IM2.2	Discuss the aetiology of risk factors both modifiable and non modifiable of atherosclerosis and IHD	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM2.3	Discuss and describe the lipid cycle and the role of dyslipidemia in the pathogenesis of atherosclerosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry	
IM2.4	Discuss and describe the pathogenesis natural history, evolution and complications of atherosclerosis and IHD	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM2.5	Define the various acute coronary syndromes and describe their evolution, natural history and outcomes	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM2.6	Elicit document and present an appropriate history that includes onset evolution, presentation risk factors, family history, comorbid conditions, complications, medication, history of atherosclerosis, IHD and coronary syndromes	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			
IM2.7	Perform, demonstrate and document a physical examination including a vascular and cardiac examination that is appropriate for the clinical presentation	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			
IM2.8	Generate document and present a differential diagnosis based on the clinical presentation and prioritise based on “cannot miss”, most likely diagnosis and severity	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			
IM2.9	Distinguish and differentiate between stable and unstable angina and AMI based on the clinical presentation	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			
IM2.10	Order, perform and interpret an ECG	S	P	Y	Bedside clinic, DOAP session	Skill assessment	3		

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
IM2.11	Order and interpret a Chest X-ray and markers of acute myocardial infarction	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			
IM2.12	Choose and interpret a lipid profile and identify the desirable lipid profile in the clinical context	S	SH	Y	Bedside clinic, DOAP session	Skill assessment		Biochemistry	
IM2.13	Discuss and enumerate the indications for and findings on echocardiogram, stress testing and coronary angiogram	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
IM2.14	Discuss and describe the indications for admission to a coronary care unit and supportive therapy for a patient with acute coronary syndrome	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
IM2.15	Discuss and describe the medications used in patients with an acute coronary syndrome based on the clinical presentation	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
IM2.16	Discuss and describe the indications for acute thrombolysis, PTCA and CABG	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
IM2.17	Discuss and describe the indications and methods of cardiac rehabilitation	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
IM2.18	Discuss and describe the indications, formulations, doses, side effects and monitoring for drugs used in the management of dyslipidemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology, Biochemistry	
IM2.19	Discuss and describe the pathogenesis, recognition and management of complications of acute coronary syndromes including arrhythmias, shock, LV dysfunction, papillary muscle rupture and pericarditis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
IM2.20	Discuss and describe the assessment and relief of pain in acute coronary syndromes	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
IM2.21	Observe and participate in a controlled environment an ACLS program	S	KH	N	DOAP session	NA			
IM2.22	Perform and demonstrate in a mannequin BLS	S	P	Y	DOAP session	Skill assessment	1		

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
IM2.23	Describe and discuss the indications for nitrates, anti platelet agents, gpIIb IIIa inhibitors, beta blockers, ACE inhibitors etc in the management of coronary syndromes	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
IM2.24	Counsel and communicate to patients with empathy lifestyle changes in atherosclerosis / post coronary syndromes	C/A	SH	Y	DOAP session	Skill assessment		AETCOM	
Topic: Pneumonia		**Number of competencies: (19)**				**Number of procedures that require certification: (NIL)**			
IM3.1	Define, discuss, describe and distinguish community acquired pneumonia, nosocomial pneumonia and aspiration pneumonia	K	K	Y	Lecture, Small group discussion	Short note/ Viva voce		Human Anatomy, Pathology, Microbiology	
IM3.2	Discuss and describe the aetiologies of various kinds of pneumonia and their microbiology depending on the setting and immune status of the host	K	K	Y	Lecture, Small group discussion	Short note/ Viva voce		Microbiology	
IM3.3	Discuss and describe the pathogenesis, presentation, natural history and complications of pneumonia	K	K	Y	Lecture, Small group discussion	Short note/ Viva voce		Pathology, Microbiology	
IM3.4	Elicit document and present an appropriate history including the evolution, risk factors including immune status and occupational risk	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			
IM3.5	Perform, document and demonstrate a physical examination including general examination and appropriate examination of the lungs that establishes the diagnosis, complications and severity of disease	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			
IM3.6	Generate document and present a differential diagnosis based on the clinical features, and prioritise the diagnosis based on the presentation	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			
IM3.7	Order and interpret diagnostic tests based on the clinical presentation including: CBC, Chest X ray PA view, Mantoux, sputum gram stain, sputum culture and sensitivity, pleural fluid examination and culture, HIV testing and ABG	S	SH	Y	Bedside clinic, DOAP session	Skill assessment		Radiodiagnosis, Microbiology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
IM3.8	Demonstrate in a mannequin and interpret results of an arterial blood gas examination	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			
IM3.9	Demonstrate in a mannequin and interpret results of a pleural fluid aspiration	S	SH	Y	DOAP session	Skill assessment			
IM3.10	Demonstrate the correct technique in a mannequin and interpret results of a blood culture	S	SH	Y	DOAP session	Skill assessment		Microbiology	
IM3.11	Describe and enumerate the indications for further testing including HRCT, Viral cultures, PCR and specialised testing	S	SH	Y	Bedside clinic, DOAP session	Skill assessment		Radiodiagnosis, Microbiology	
IM3.12	Select, describe and prescribe based on the most likely aetiology, an appropriate empirical antimicrobial based on the pharmacology and antimicrobial spectrum	S	SH	Y	Bed side clinic, DOAP session	Skill Assessment/ Written/ Viva voce		Pharmacology, Microbiology	
IM3.13	Select, describe and prescribe based on culture and sensitivity appropriate empaling antimicrobial based on the pharmacology and antimicrobial spectrum.	S	SH	Y	Bedside clinic, DOAP session	Skill assessment/ Written/ Viva voce		Pharmacology, Microbiology	
IM3.14	Perform and interpret a sputum gram stain and AFB	S	P	Y	DOAP session	Skill assessment		Microbiology	
IM3.15	Describe and enumerate the indications for hospitalisation in patients with pneumonia	K	K	Y	Lecture, Small group discussion	Short note/ Viva voce			
IM3.16	Describe and enumerate the indications for isolation and barrier nursing in patients with pneumonia	K	K	Y	Lecture, Small group discussion	Short note/ Viva voce			
IM3.17	Describe and discuss the supportive therapy in patients with pneumonia including oxygen use and indications for ventilation	K	K	Y	Lecture, Small group discussion	Short note/ Viva voce			
IM3.18	Communicate and counsel patient on family on the diagnosis and therapy of pneumonia	C/A	SH	Y	DOAP session	Skill assessment			
IM3.19	Discuss, describe, enumerate the indications and communicate to patients on pneumococcal and influenza vaccines	S/C	K	Y	Lecture, Small group discussion	Short note/ Viva voce		Microbiology	
Topic: Fever and febrile syndromes		**Number of competencies: (26)**				**Number of procedures that require certification : (NIL)**			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
IM4.1	Describe and discuss the febrile response and the influence of host immune status, risk factors and comorbidities on the febrile response	K	K	Y	Lecture, Small group discussion	Written		Microbiology	
IM4.2	Describe and discuss the influence of special populations on the febrile response including: the elderly, immune suppression, malignancy and neutropenia, HIV and travel	K	K	Y	Lecture, Small group discussion	Written		Microbiology	
IM4.3	Discuss and describe the common causes, pathophysiology and manifestations of fever in various regions in India including bacterial, parasitic and viral causes (e.g.Dengue, Chikungunya, Typhus)	K	K	Y	Lecture, Small group discussion	Written		Microbiology, Community Medicine	
IM4.4	Describe and discuss the pathophysiology and manifestations of inflammatory causes of fever	K	KH	Y	Lecture, Small group discussion	Written		Microbiology	
IM4.5	Describe and discuss the pathophysiology and manifestations of malignant causes of fever including hematologic and lymph node malignancies	K	KH	Y	Lecture, Small group discussion	Written		Pathology, Microbiology	
IM4.6	Discuss and describe the pathophysiology and manifestations of malaria	K	KH	Y	Lecture, Small group discussion	Written		Microbiology	
IM4.7	Discuss and describe the pathophysiology and manifestations of the sepsis syndrome	K	K	Y	Lecture, Small group discussion	Written			
IM4.8	Discuss and describe the pathophysiology, aetiology and clinical manifestations of fever of unknown origin (FUO) including in a normal host, neutropenic host, nosocomial host and a host with HIV disease	K	K	Y	Lecture, Small group discussion	Written		Microbiology	
IM4.9	Elicit document and present a medical history that helps delineate the aetiology of fever that includes the evolution and pattern of fever, associated symptoms, immune status, comorbidities, risk factors, exposure through occupation, travel and environment and medication use	S	SH	Y	Bedside clinic, DOAP session	Skill assessment		Microbiology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
IM4.10	Perform a systematic examination that establishes the diagnosis and severity of presentation that includes: general skin mucosal and lymph node examination, chest and abdominal examination (including examination of the liver and spleen)	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			
IM4.11	Generate a differential diagnosis and prioritise based on clinical features that help distinguish between infective, inflammatory, malignant and rheumatologic causes	K	SH	Y	Bedside clinic, DOAP session	Written/ Viva voce			
IM4.12	Order and interpret diagnostic tests based on the differential diagnosis including: CBC with differential, peripheral smear, urinary analysis with sediment, Chest X ray, blood and urine cultures, sputum gram stain and cultures, sputum AFB and cultures, CSF analysis, pleural and body fluid analysis, stool routine and culture and QBC	K	SH	Y	Bedside clinic, Skill assessment	Skill assessment		Pathology, Microbiology	
IM4.13	Perform and interpret a sputum gram stain	S	SH	Y	DOAP session	Log book/ documentation		Microbiology	
IM4.14	Perform and interpret a sputum AFB	S	SH	Y	DOAP session	Log book/ documentation		Microbiology	
IM4.15	Perform and interpret a malarial smear	S	SH	Y	DOAP session	Log book/ documentation/ Skill assessment		Microbiology	
IM4.16	Enumerate the indications and describe the findings in tests of inflammation and specific rheumatologic tests, serologic testing for pathogens including HIV, bone marrow aspiration and biopsy	K	KH	N	Lecture, Small group discussion	Written		Pathology	
IM4.17	Observe and assist in the performance of a bone marrow aspiration and biopsy in a simulated environment	S	SH	N	Skills lab	Log book/ documentation/ DOAP session		Pathology	
IM4.18	Enumerate the indications for use of imaging in the diagnosis of febrile syndromes	K	KH	N	Lecture, Small group discussion	Written/ Viva voce			
IM4.19	Assist in the collection of blood and wound cultures	S	SH	Y	DOAP session	Log book/ documentation		Microbiology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
IM4.20	Interpret a PPD (Mantoux)	S	SH	Y	DOAP session	Log book/ documentation		Microbiology	
IM4.21	Develop and present an appropriate diagnostic plan based on the clinical presentation, most likely diagnosis in a prioritised and cost effective manner	K	KH	Y	Bedside clinic, Skill assessment	Skill assessment			
IM4.22	Describe and discuss the pharmacology, indications, adverse reactions, interactions of antimalarial drugs and basis of resistance	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
IM4.23	Prescribe drugs for malaria based on the species identified, prevalence of drug resistance and national programs	S	SH	Y	Small group discussion	Skill assessment		Microbiology, Pharmacology	
IM4.24	Develop an appropriate empiric treatment plan based on the patient's clinical and immune status pending definitive diagnosis	C	SH	Y	DOAP session	Skill assessment			
IM4.25	Communicate to the patient and family the diagnosis and treatment	C	SH	Y	DOAP session	Skill assessment		AETCOM	
IM4.26	Counsel the patient on malarial prevention	C	SH	Y	DOAP session	Skill assessment		Microbiology, Pharmacology	
Topic: Liver disease		**Number of competencies: (18)**				**Number of procedures that require certification : (NIL)**			
IM5.1	Describe and discuss the physiologic and biochemical basis of hyperbilirubinemia	K	K	Y	Lecture, Small group discussion	Written/Viva voce		Pathology, Physiology	
IM5.2	Describe and discuss the aetiology and pathophysiology of liver injury	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM5.3	Describe and discuss the pathologic changes in various forms of liver disease	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM5.4	Describe and discuss the epidemiology, microbiology, immunology and clinical evolution of infective (viral) hepatitis	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Microbiology	
IM5.5	Describe and discuss the pathophysiology and clinical evolution of alcoholic liver disease	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
IM5.6	Describe and discuss the pathophysiology, clinical evolution and complications of cirrhosis and portal hypertension including ascites, spontaneous bacterial peritonitis, hepatorenal syndrome and hepatic encephalopathy	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM5.7	Enumerate and describe the causes and pathophysiology of drug induced liver injury	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Pharmacology	
IM5.8	Describe and discuss the pathophysiology, clinical evolution and complications cholelithiasis and cholecystitis	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
IM5.9	Elicit document and present a medical history that helps delineate the aetiology of the current presentation and includes clinical presentation, risk factors, drug use, sexual history, vaccination history and family history	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			
IM5.10	Perform a systematic examination that establishes the diagnosis and severity that includes nutritional status, mental status, jaundice, abdominal distension ascites, features of portosystemic hypertension and hepatic encephalopathy	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			
IM5.11	Generate a differential diagnosis and prioritise based on clinical features that suggest a specific aetiology for the presenting symptom	K	KH	Y	Bedside clinic, DOAP session	Skill assessment/ Viva voce			
IM5.12	Choose and interpret appropriate diagnostic tests including: CBC, bilirubin, function tests, Hepatitis serology and ascitic fluid examination in patient with liver diseases.	S	KH	Y	Bedside clinic, DOAP session	Skill assessment		Pathology	
IM5.13	Enumerate the indications for ultrasound and other imaging studies including MRCP and ERCP and describe the findings in liver disease	K	K	Y	Bedside clinic,Small group discussion	Viva voce/ Written		Radiodiagnosis	General Surgery
IM5.14	Outline a diagnostic approach to liver disease based on hyperbilirubinemia, liver function changes and hepatitis serology	S	SH	Y	Bedside clinic,Small group discussion	Viva voce/ Written		Pathology, Microbiology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
IM5.15	Assist in the performance and interpret the findings of an ascitic fluid analysis	S	KH	Y	DOAP session	documentation in log book			
IM5.16	Describe and discuss the management of hepatitis, cirrhosis, portal hypertension, ascites spontaneous, bacterial peritonitis and hepatic encephalopathy	K	KH	Y	Written, Small group discussion	Skill assessment/ Written/ Viva voce		Pharmacology	General Surgery
IM5.17	Enumerate the indications, precautions and counsel patients on vaccination for hepatitis	K/C	SH	Y	Written, Small group discussion	Written/ Viva voce		Microbiology	
IM5.18	Enumerate the indications for hepatic transplantation	K	K	Y	Written, Small group discussion	Written/ Viva voce			General Surgery
Topic: HIV		**Number of competencies: (23)**				**Number of procedures that require certification : (NIL)**			
IM6.1	Describe and discuss the symptoms and signs of acute HIV seroconversion	K	KH	Y	Lecture, Small group discussion	Short note/ Viva voce		Microbiology	
IM6.2	Define and classify HIV AIDS based on the CDC criteria	K	KH	Y	Lecture, Small group discussion	Short notes/ Viva voce		Microbiology	
IM6.3	Describe and discuss the relationship between CDC count and the risk of opportunistic infections	K	KH	Y	Lecture, Small group discussion	Short notes/ Viva voce		Microbiology	
IM6.4	Describe and discuss the pathogenesis, evolution and clinical features of common HIV related opportunistic infections	K	KH	Y	Lecture, Small group discussion	Short notes/ Viva voce		Microbiology	
IM6.5	Describe and discuss the pathogenesis, evolution and clinical features of common HIV related malignancies	K	KH	Y	Lecture, Small group discussion	Short notes/ Viva voce		Pathology, Microbiology	
IM6.6	Describe and discuss the pathogenesis, evolution and clinical features of common HIV related skin and oral lesions	K	KH	Y	Lecture, Small group discussion	Short notes/ Viva voce		Pathology, Microbiology	
IM6.7	Elicit document and present a medical history that helps delineate the aetiology of the current presentation and includes risk factors for HIV, mode of infection, other sexually transmitted diseases, risks for opportunistic infections and nutritional status	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
IM6.8	Generate a differential diagnosis and prioritise based on clinical features that suggest a specific aetiology for the presenting symptom	S	SH	Y	Bedside clinic, DOAP session, Small group discussion	Skill assessment			
IM6.9	Choose and interpret appropriate diagnostic tests to diagnose and classify the severity of HIV-AIDS including specific tests of HIV, CDC	K	KH	Y	Bedside clinic, DOAP session, Small group discussion	Written/ Skill assessment		Pathology, Microbiology	
IM6.10	Choose and interpret appropriate diagnostic tests to diagnose opportunistic infections including CBC, sputum examination and cultures, blood cultures, stool analysis, CSF analysis and Chest radiographs	S	KH	Y	Bedside clinic, DOAP session, Small group discussion	Written/ Skill assessment			
IM6.11	Enumerate the indications and describe the findings for CT of the chest and brain and MRI	K	K	N	Small group discussion, Lecture, Bedside clinic	Written/ Viva voce		Radiodiagnosis	
IM6.12	Enumerate the indications for and interpret the results of: pulse oximetry, ABG, Chest Radiograph	K	KH	Y	Bedside clinic, DOAP session, Small group discussion	Written/ Skill assessment			
IM6.13	Describe and enumerate the indications and side effects of drugs for bacterial, viral and other types of diarrhea	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology, Microbiology	
IM6.14	Perform and interpret AFB sputum	S	P	Y	DOAP session	Skill assessment		Microbiology	
IM6.15	Demonstrate in a model the correct technique to perform a lumbar puncture	S	SH	Y	Simulation	Skill assessment		Microbiology	
IM6.16	Discuss and describe the principles of HAART, the classes of antiretrovirals used, adverse reactions and interactions	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology, Pharmacology	
IM6.17	Discuss and describe the principles and regimens used in post exposure prophylaxis	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology, Pharmacology	
IM6.18	Enumerate the indications and discuss prophylactic drugs used to prevent HIV related opportunistic infections	K/C	K	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Microbiology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
IM6.19	Counsel patients on prevention of HIV transmission	C	SH	Y	DOAP session	Skills assessment		AETCOM	
IM6.20	Communicate diagnosis, treatment plan and subsequent follow up plan to patients	C	SH	Y	DOAP session	Skills assessment		AETCOM	
IM6.21	Communicate with patients on the importance of medication adherence	C	SH	Y	DOAP session	Skills assessment		AETCOM	
IM6.22	Demonstrate understanding of ethical and legal issues regarding patient confidentiality and disclosure in patients with HIV	K/A	SH	Y	DOAP session, Small group discussion	Viva voce/ Written/ Skill Assessment		AETCOM	
IM6.23	Demonstrate a non-judgemental attitude to patients with HIV and to their lifestyles	A	SH	Y	Small group discussion	observation by teacher		AETCOM	
Topic: Rheumatologic problems		**Number of competencies: (27)**				**Number of procedures that require certification: (NIL)**			
IM7.1	Describe the pathophysiology of autoimmune disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM7.2	Describe the genetic basis of autoimmune disease	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM7.3	Classify cause of joint pain based on the pathophysiology	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
IM7.4	Develop a systematic clinical approach to joint pain based on the pathophysiology	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Orthopedics
IM7.5	Describe and discriminate acute, subacute and chronic causes of joint pain	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Orthopedics
IM7.6	Discriminate, describe and discuss arthralgia from arthritis and mechanical from inflammatory causes of joint pain	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Orthopedics
IM7.7	Discriminate, describe and discuss distinguishing articular from periarticular complaints	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Orthopedics
IM7.8	Determine the potential causes of join pain based on the presenting features of joint involvement	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Orthopedics

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
IM7.9	Describe the common signs and symptoms of articular and periarticular diseases	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Orthopedics
IM7.10	Describe the systemic manifestations of rheumatologic disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
IM7.11	Elicit document and present a medical history that will differentiate the aetiologies of disease	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			
IM7.12	Perform a systematic examination of all joints, muscle and skin that will establish the diagnosis and severity of disease	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			Orthopedics
IM7.13	Generate a differential diagnosis and prioritise based on clinical features that suggest a specific aetiology	K/S	KH	Y	Bedside clinic, Small group discussion	Skill assessment/ Written			
IM7.14	Describe the appropriate diagnostic work up based on the presumed aetiology	K	KH	Y	Bedside clinic, Small group discussion	Skill assessment/ Written			
IM7.15	Enumerate the indications for and interpret the results of : CBC, anti-CCP, RA, ANA, DNA and other tests of autoimmunity	K	SH	Y	Bedside clinic, Small group discussion	Skill assessment/ Written		Pathology	
IM7.16	Enumerate the indications for arthrocentesis	K	K	Y	Small group discussion, Lecture	Written/ Viva voce			Orthopedics
IM7.17	Enumerate the indications and interpret plain radiographs of joints	K	SH	Y	Bedside clinic, Small group discussion	Skill assessment/ Written		Radiodiagnosis	Orthopedics
IM7.18	Communicate diagnosis, treatment plan and subsequent follow up plan to patients	C	SH	Y	DOAP session	Skill assessment/ Written			
IM7.19	Develop an appropriate treatment plan for patients with rheumatologic diseases	K	KH	Y	Bedside clinic, Small group discussion	Skill assessment/ Written			
IM7.20	Select, prescribe and communicate appropriate medications for relief of joint pain	K/C	SH	Y	DOAP session	Skill assessment/ Written		Pharmacology	Orthopedics
IM7.21	Select, prescribe and communicate preventive therapy for crystalline arthropathies	K/C	SH	Y	DOAP session	Skill assessment/ Written		Pharmacology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
IM7.22	Select, prescribe and communicate treatment option for systemic rheumatologic conditions	K/C	SH	Y	DOAP session	Skill assessment/ Written		Pharmacology	
IM7.23	Describe the basis for biologic and disease modifying therapy in rheumatologic diseases	K	KH	Y	Bedside clinic, Small group discussion	Skill assessment/ Written		Pharmacology	
IM7.24	Communicate and incorporate patient preferences in the choice of therapy	C/A	SH	Y	DOAP session	Skill assessment		AETCOM	
IM7.25	Develop and communicate appropriate follow up and monitoring plans for patients with rheumatologic conditions	C	SH	Y	DOAP session	Skill assessment			
IM7.26	Demonstrate an understanding of the impact of rheumatologic conditions on quality of life, well being, work and family	A	SH	Y	DOAP session	Skill assessment			
IM7.27	Determine the need for specialist consultation	K	K	Y	Small group discussion, Lecture	Viva voce			
Topic: Hypertension		**Number of competencies: (20)**				**Number of procedures that require certification: (NIL)**			
IM8.1	Describe and discuss the epidemiology, aetiology and the prevalence of primary and secondary hypertension	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM8.2	Describe and discuss the pathophysiology of hypertension	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM8.3	Describe and discuss the genetic basis of hypertension	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM8.4	Define and classify hypertension	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM8.5	Describe and discuss the differences between primary and secondary hypertension	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM8.6	Define, describe and discuss and recognise hypertensive urgency and emergency	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
IM8.7	Describe and discuss the clinical manifestations of the various aetiologies of secondary causes of hypertension	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM8.8	Describe, discuss and identify target organ damage due to hypertension	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM8.9	Elicit document and present a medical history that includes: duration and levels, symptoms, comorbidities, lifestyle, risk factors, family history, psychosocial and environmental factors, dietary assessment, previous and concomitant therapy	K	SH	Y	Bedside clinic, DOAP session	Skill assessment			
IM8.10	Perform a systematic examination that includes : an accurate measurement of blood pressure, fundus examination, examination of vasculature and heart	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			
IM8.11	Generate a differential diagnosis and prioritise based on clinical features that suggest a specific aetiology	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			
IM8.12	Describe the appropriate diagnostic work up based on the presumed aetiology	K	KH	Y	Small group discussion	Skill assessment/ Written/ Viva voce			
IM8.13	Enumerate the indications for and interpret the results of : CBC, Urine routine, BUN, Cr, Electrolytes, Uric acid, ECG	K	KH	Y	Small group discussion	Skill assessment/ Written/ Viva voce			
IM8.14	Develop an appropriate treatment plan for essential hypertension	K	KH	Y	Small group discussion	Written/ Viva voce		Pharmacology	
IM8.15	Recognise, prioritise and manage hypertensive emergencies	S	SH	Y	DOAP session	Skill assessment/ Written		Pharmacology	
IM8.16	Develop and communicate to the patient lifestyle modification including weight reduction, moderation of alcohol intake, physical activity and sodium intake	C	SH	Y	DOAP session	Skill assessment			
IM8.17	Perform and interpret a 12 lead ECG	S	P	Y	DOAP session	documentation in log book/ skills station			
IM8.18	Incorporate patient preferences in the management of HTN	A/C	SH	Y	DOAP session	Skill assessment			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
IM8.19	Demonstrate understanding of the impact of Hypertension on quality of life, well being, work and family	A	SH	Y	Bedside clinic, DOAP session	observation by faculty			
IM8.20	Determine the need for specialist consultation	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
Topic: Anemia		**Number of competencies: (21)**				**Number of procedures that require certification : (NIL)**			
IM9.1	Define, describe and classify anemia based on red blood cell size and reticulocyte count	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM9.2	Describe and discuss the morphological characteristics, aetiology and prevalence of each of the causes of anemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM9.3	Elicit document and present a medical history that includes symptoms, risk factors including GI bleeding, prior history, medications, menstrual history, and family history	S	SH	Y	Bed side clinic, DOAP session	Skill assessment			
IM9.4	Perform a systematic examination that includes : general examination for pallor, oral examination, DOAP session of hyper dynamic circulation, lymph node and splenic examination	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			
IM9.5	Generate a differential diagnosis and prioritise based on clinical features that suggest a specific aetiology	S	SH	Y	Bedside clinic, DOAP session	Skill assessment/ Written		Pathology	
IM9.6	Describe the appropriate diagnostic work up based on the presumed aetiology	S	SH	Y	Bedside clinic, DOAP session	Skill assessment/ Written		Pathology	
IM9.7	Describe and discuss the meaning and utility of various components of the hemogram	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce/ Skill assessment		Pathology	
IM9.8	Describe and discuss the various tests for iron deficiency	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce/ Skill assessment		Pathology	
IM9.9	Order and interpret tests for anemia including hemogram, red cell indices, reticulocyte count, iron studies, B12 and folate	S	SH	Y	Bedside clinic, DOAP session	Skill assessment/ Written		Pathology	
IM9.10	Describe, perform and interpret a peripheral smear and stool occult blood	S	SH	P	Bedside clinic, DOAP session	Skill assessment/ Written		Pathology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
IM9.11	Describe the indications and interpret the results of a bone marrow aspirations and biopsy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce/ Skill assessment		Pathology	
IM9.12	Describe, develop a diagnostic plan to determine the aetiology of anemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce/ Skill assessment		Pathology	
IM9.13	Prescribe replacement therapy with iron, B12, folate	S	SH	Y	Bedside clinic, DOAP session	Skill assessment/ Written		Pharmacology	
IM9.14	Describe the national programs for anemia prevention	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology, Community Medicine	
IM9.15	Communicate the diagnosis and the treatment appropriately to patients	C	SH	Y	DOAP session	Skill assessment			
IM9.16	Incorporate patient preferences in the management of anemia	C	SH	Y	DOAP session	Skill assessment			
IM9.17	Describe the indications for blood transfusion and the appropriate use of blood components	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce/ Skill assessment		Pathology	
IM9.18	Describe the precautions required necessary when performing a blood transfusion	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce/ Skill assessment			
IM9.19	Assist in a blood transfusion	S	SH	Y	Bedside clinic	document in log book			
IM9.20	Communicate and counsel patients with methods to prevent nutritional anemia	C	SH	Y	DOAP session	Skill assessment			
IM9.21	Determine the need for specialist consultation	K	KH	Y	Lecture, Small group discussion	Written			
Topic: Acute Kidney Injury and Chronic renal failure		**Number of competencies: (31)**				**Number of procedures that require certification: (NIL)**			
IM10.1	Define, describe and differentiate between acute and chronic renal failure	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM10.2	Classify, describe and differentiate the pathophysiologic causes of acute renal failure	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
IM10.3	Describe the pathophysiology and causes of pre renal ARF, renal and post renal ARF	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM10.4	Describe the evolution, natural history and treatment of ARF	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM10.5	Describe and discuss the aetiology of CRF	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM10.6	Stage Chronic Kidney Disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM10.7	Describe and discuss the pathophysiology and clinical findings of uraemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM10.8	Classify, describe and discuss the significance of proteinuria in CKD	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM10.9	Describe and discuss the pathophysiology of anemia and hyperparathyroidism in CKD	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM10.10	Describe and discuss the association between CKD glycemia and hypertension	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM10.11	Describe and discuss the relationship between CAD risk factors and CKD and in dialysis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM10.12	Elicit document and present a medical history that will differentiate the aetiologies of disease, distinguish acute and chronic disease, identify predisposing conditions, nephrotoxic drugs and systemic causes	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			
IM10.13	Perform a systematic examination that establishes the diagnosis and severity including determination of volume status, presence of edema and heart failure, features of uraemia and associated systemic disease	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			
IM10.14	Generate a differential diagnosis and prioritise based on clinical features that suggest a specific aetiology	K	KH	Y	DOAP session, Small group discussion	Skill assessment/ Written/ Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
IM10.15	Describe the appropriate diagnostic work up based on the presumed aetiology	K	SH	Y	DOAP session, Small group discussion	Skill assessment/ Written/ Viva voce			
IM10.16	Enumerate the indications for and interpret the results of : renal function tests, calcium, phosphorus, PTH, urine electrolytes, osmolality, Anion gap	K	KH	Y	DOAP session, Small group discussion	Skill assessment/ Written/ Viva voce		Pathology	
IM10.17	Describe and calculate indices of renal function based on available laboratories including FENa (Fractional Excretion of Sodium) and CrCl (Creatinine Clearance)	S	SH	Y	DOAP session, Small group discussion	Skill assessment/ Written/ Viva voce		Pathology	
IM10.18	Identify the ECG findings in hyperkalemia	S	SH	Y	DOAP session, Small group discussion	Skill assessment/ Written/ Viva voce			
IM10.19	Enumerate the indications and describe the findings in renal ultrasound	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Radiodiagnosis	
IM10.20	Describe and discuss the indications to perform arterial blood gas analysis: interpret the data	S	P	Y	DOAP session	documentation in log book			
IM10.21	Describe and discuss the indications for and insert a peripheral intravenous catheter	S	P	Y	DOAP session, Bedside clinic	documentation in logbook			
IM10.22	Describe and discuss the indications, demonstrate in a model and assist in the insertion of a central venous or a dialysis catheter	S	SH	N	DOAP session	Skill assessment with model			
IM10.23	Communicate diagnosis treatment plan and subsequent follow up plan to patients	C	SH	Y	DOAP session	Skill assessment			
IM10.24	Counsel patients on a renal diet	K	SH	Y	DOAP session	Skill assessment			
IM10.25	Identify and describe the priorities in the management of ARF including diet, volume management, alteration in doses of drugs, monitoring and indications for dialysis	K/C	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
IM10.26	Describe and discuss supportive therapy in CKD including diet, anti hypertensives, glycemic therapy, dyslipidemia, anemia, hyperkalemia, hyperphosphatemia and secondary hyperparathyroidism	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
IM10.27	Describe and discuss the indications for renal dialysis	C/A	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
IM10.28	Describe and discuss the indications for renal replacement therapy	C	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
IM10.29	Describe discuss and communicate the ethical and legal issues involved in renal replacement therapy	C/A	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
IM10.30	Recognise the impact of CKD on patient's quality of life well being work and family	A	K	Y	Lecture, Small group discussion, Bedside clinic	observation by faculty			
IM10.31	Incorporate patient preferences in to the care of CKD	A/C	KH	Y	Lecture, Small group discussion, Bedside clinic	observation by faculty			
Topic: Diabetes Mellitus		**Number of competencies: (24)**				**Number of procedures that require certification : (02)**			
IM11.1	Define and classify diabetes	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
IM11.2	Describe and discuss the epidemiology and pathogenesis and risk factors and clinical evolution of type 1 diabetes	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM11.3	Describe and discuss the epidemiology and pathogenesis and risk factors economic impact and clinical evolution of type 2 diabetes	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM11.4	Describe and discuss the genetic background and the influence of the environment on diabetes	K	KH	N	Lecture, Small group discussion	Written/ Viva voce			
IM11.5	Describe and discuss the pathogenesis and temporal evolution of microvascular and macrovascular complications of diabetes	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM11.6	Describe and discuss the pathogenesis and precipitating factors, recognition and management of diabetic emergencies	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
IM11.7	Elicit document and present a medical history that will differentiate the aetiologies of diabetes including risk factors, precipitating factors, lifestyle, nutritional history, family history, medication history, co-morbidities and target organ disease	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			
IM11.8	Perform a systematic examination that establishes the diagnosis and severity that includes skin, peripheral pulses, blood pressure measurement, fundus examination, detailed examination of the foot (pulses, nervous and deformities and injuries)	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			
IM11.9	Describe and recognise the clinical features of patients who present with a diabetic emergency	K	KH	Y	Small group discussion, Lecture	Written/ Viva voce			
IM11.10	Generate a differential diagnosis and prioritise based on clinical features that suggest a specific aetiology	K	KH	Y	Small group discussion, Lecture	Written/ Viva voce			
IM11.11	Order and interpret laboratory tests to diagnose diabetes and its complications including: glucoses, glucose tolerance test, glycosylated hemoglobin, urinary micro albumin, ECG, electrolytes, ABG, ketones, renal function tests and lipid profile	S	SH	Y	Bedside clinic, DOAP session	Skill assessment		Pathology	
IM11.12	Perform and interpret a capillary blood glucose test	S	P	Y	Bedside clinic, DOAP session	Skill assessment	2	Pathology, Biochemistry	
IM11.13	Perform and interpret a urinary ketone estimation with a dipstick	S	P	Y	Bedside clinic, DOAP session	Skill assessment	2	Pathology, Biochemistry	
IM11.14	Recognise the presentation of hypoglycaemia and outline the principles on its therapy	K	KH	Y	Small Group discussion, Lecture	Written/ Viva voce			
IM11.15	Recognise the presentation of diabetic emergencies and outline the principles of therapy	K	KH	Y	Small Group discussion, Lecture	Written/ Viva voce			
IM11.16	Discuss and describe the pharmacologic therapies for diabetes their indications, contraindications, adverse reactions and interactions	K	KH	Y	Small Group discussion, Lecture	Written/ Viva voce		Pharmacology	
IM11.17	Outline a therapeutic approach to therapy of T2Diabetes based on presentation, severity and complications in a cost effective manner	K	KH	Y	Small Group discussion, Lecture	Written/ Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
IM11.18	Describe and discuss the pharmacology, indications, adverse reactions and interactions of drugs used in the prevention and treatment of target organ damage and complications of Type II Diabetes including neuropathy, nephropathy, retinopathy, hypertension, dyslipidemia and cardiovascular disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
IM11.19	Demonstrate and counsel patients on the correct technique to administer insulin	S/C	SH	Y	DOAP session	Skill assessment		Pharmacology	
IM11.20	Demonstrate to and counsel patients on the correct technique of self monitoring of blood glucoses	S/C	SH	Y	DOAP session	Skill assessment			
IM11.21	Recognise the importance of patient preference while selecting therapy for diabetes	A	KH	Y	DOAP session	faculty observation			
IM11.22	Enumerate the causes of hypoglycaemia and describe the counter hormone response and the initial approach and treatment	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM11.23	Describe the precipitating causes, pathophysiology, recognition, clinical features, diagnosis, stabilisation and management of diabetic ketoacidosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
IM11.24	Describe the precipitating causes, pathophysiology, recognition, clinical features, diagnosis, stabilisation and management of Hyperosmolar non ketotic state	K	KH	N	Lecture, Small group discussion	Written/ Viva voce			
Topic: Thyroid dysfunction		**Number of competencies: (15)**				**Number of procedures that require certification : (NIL)**			
IM12.1	Describe the epidemiology and pathogenesis of hypothyroidism and hyperthyroidism including the influence of iodine deficiency and autoimmunity in the pathogenesis of thyroid disease	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM12.2	Describe and discuss the genetic basis of some forms of thyroid dysfunction	K	K	N	Lecture, Small group discussion	Written/ Viva voce			
IM12.3	Describe and discuss the physiology of the hypothalamopituitary - thyroid axis, principles of thyroid function testing and alterations in physiologic function	K	K	Y	Lecture, Small group discussion	Short notes		Pathology, Physiology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
IM12.4	Describe and discuss the principles of radio iodine uptake in the diagnosis of thyroid disorders	K	KH	Y	Lecture, Small group discussion	Short notes/ Viva voce			
IM12.5	Elicit document and present an appropriate history that will establish the diagnosis cause of thyroid dysfunction and its severity	S	SH	Y	Bedside clinic	Skill assessment/ Short case			
IM12.6	Perform and demonstrate a systematic examination based on the history that will help establish the diagnosis and severity including systemic signs of thyrotoxicosis and hypothyroidism, palpation of the pulse for rate and rhythm abnormalities, neck palpation of the thyroid and lymph nodes and cardiovascular findings	S	SH	Y	Bed side clinic, DOAP session	Skill assessment			General Surgery
IM12.7	Demonstrate the correct technique to palpate the thyroid	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			General Surgery
IM12.8	Generate a differential diagnosis based on the clinical presentation and prioritise it based on the most likely diagnosis	K	KH	Y	Bedside clinic, small group discussion	Short case			General Surgery
IM12.9	Order and interpret diagnostic testing based on the clinical diagnosis including CBC, thyroid function tests and ECG and radio iodine uptake and scan	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			General Surgery
IM12.10	Identify atrial fibrillation, pericardial effusion and bradycardia on ECG	S	SH	Y	Bedside clinic, lab	Skill assessment			General Surgery
IM12.11	Interpret thyroid function tests in hypo and hyperthyroidism	S	SH	Y	Bedside clinic, lab	Skill assessment			General Surgery
IM12.12	Describe and discuss the iodisation programs of the government of India	K	KH	Y	Lecture, Bedside clinic	Short note		Community Medicine	
IM12.13	Describe the pharmacology, indications, adverse reaction, interactions of thyroxine and antithyroid drugs	K	KH	Y	Lecture, Small group discussion	Viva voce/ Short note		Pharmacology	General Surgery
IM12.14	Write and communicate to the patient appropriately a prescription for thyroxine based on age, sex, and clinical and biochemical status	S/C	SH	Y	Skill assessment	Skill assessment		Pharmacology	
IM12.15	Describe and discuss the indications of thionamide therapy, radio iodine therapy and surgery in the management of thyrotoxicosis	K	KH	Y	Bedside clinic, Small group discussion	Short note/ Viva voce		Pharmacology	General Surgery

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
Topic: Common malignancies		**Number of competencies: (19)**				**Number of procedures that require certification : (NIL)**			
IM13.1	Describe the clinical epidemiology and inherited & modifiable risk factors for common malignancies in India	K	K	Y	Lecture, Small group discussion	Short note/ Viva voce		Pathology, Biochemistry	
IM13.2	Describe the genetic basis of selected cancers	K	K	N	Lecture, Small group discussion	Short note/ Viva voce		Pathology	
IM13.3	Describe the relationship between infection and cancers	K	K	Y	Lecture, Small group discussion	Short note/ Viva voce		Pathology, Microbiology	
IM13.4	Describe the natural history, presentation, course, complications and cause of death for common cancers	K	K	Y	Lecture, Small group discussion	Short note/ Viva voce		Pathology	
IM13.5	Describe the common issues encountered in patients at the end of life and principles of management	K	K	N	Lecture, Small group discussion	Short note/ Viva voce			
IM13.6	Describe and distinguish the difference between curative and palliative care in patients with cancer	K	K	N	Lecture, Small group discussion	Short note/ Viva voce		Pharmacology	
IM13.7	Elicit document and present a history that will help establish the aetiology of cancer and includes the appropriate risk factors, duration and evolution	S	K	Y	Bedside clinic	Skill assessment/ Short case			General Surgery
IM13.8	Perform and demonstrate a physical examination that includes an appropriate general and local examination that excludes the diagnosis, extent spread and complications of cancer	S	SH	Y	Bedside clinic	Skill assessment/ short case			General Surgery
IM13.9	Demonstrate in a mannequin the correct technique for performing breast exam, rectal examination and cervical examination and pap smear	S	K	Y	Bedside clinic	Skill assessment/ Short case		Human Anatomy	General Surgery
IM13.10	Generate a differential diagnosis based on the presenting symptoms and clinical features and prioritise based on the most likely diagnosis	S	K	Y	Bedside clinic	Skill assessment/ Short case			General Surgery
IM13.11	Order and interpret diagnostic testing based on the clinical diagnosis including CBC and stool occult blood and prostate specific antigen	S	K	Y	Bedside clinic	Skill assessment/ Short case			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
IM13.12	Describe the indications and interpret the results of Chest X Ray, mammogram, skin and tissue biopsies and tumor markers used in common cancers	K	KH	Y	Bedside clinic, Small group discussion	Short note/ Viva voce		Radiodiagnosis	
IM13.13	Describe and assess pain and suffering objectively in a patient with cancer	K	KH	Y	Bedside clinic, Small group discussion	Short note/ Viva voce		Pharmacology	General Surgery
IM13.14	Describe the indications for surgery, radiation and chemotherapy for common malignancies	K	KH	Y	Bedside clinic, Small group discussion	Short note/ Viva voce		Pharmacology	General Surgery
IM13.15	Describe the need, tests involved, their utility in the prevention of common malignancies	K	KH	Y	Bedside clinic, Small group discussion	Short note/ Viva voce		Pathology	
IM13.16	Demonstrate an understanding and needs and preferences of patients when choosing curative and palliative therapy	A/C	KH	Y	Bedside clinic, small group discussion	Short note/ Viva voce		AETCOM	
IM13.17	Describe and enumerate the indications, use, side effects of narcotics in pain alleviation in patients with cancer	K	KH	Y	Bedside clinic,Small group discussion	Short note/ Viva voce		Pharmacology	Anesthesiology
IM13.18	Describe and discuss the ethical and the medico legal issues involved in end of life care	K	KH	Y	Bedside clinic, Small group discussion	Short note/ Viva voce		AETCOM	
IM13.19	Describe the therapies used in alleviating suffering in patients at the end of life	K	KH	Y	Bedside clinic, Small group discussion	Short note/ Viva voce		AETCOM	
Topic: Obesity		**Number of competencies: (15)**				**Number of procedures that require certification: (NIL)**			
IM14.1	Define and measure obesity as it relates to the Indian population	K	K	Y	Lecture, Small group discussion	Short note/ Viva voce			
IM14.2	Describe and discuss the aetiology of obesity including modifiable and non-modifiable risk factors and secondary causes	K	K	Y	Lecture, Small group discussion	Short note/ Viva voce		Pathology	
IM14.3	Describe and discuss the monogenic forms of obesity	K	K	N	Lecture, Small group discussion	Short note/ Viva voce		Pathology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
IM14.4	Describe and discuss the impact of environmental factors including eating habits, food, work, environment and physical activity on the incidence of obesity	K	K	Y	Lecture, Small group discussion	Short note/ Viva voce		Pathology, Community Medicine	
IM14.5	Describe and discuss the natural history of obesity and its complications	K	K	Y	Lecture, Small group discussion	Short note/ Viva voce		Pathology	
IM14.6	Elicit and document and present an appropriate history that includes the natural history, dietary history, modifiable risk factors, family history, clues for secondary causes and motivation to lose weight	S	SH	Y	Bedside clinic, Skills lab	Skill assessment			
IM14.7	Perform, document and demonstrate a physical examination based on the history that includes general examination, measurement of abdominal obesity, signs of secondary causes and comorbidities	S	SH	Y	Bedside clinic, Skills lab	Skill assessment			
IM14.8	Generate a differential diagnosis based on the presenting symptoms and clinical features and prioritise based on the most likely diagnosis	S	SH	Y	Bedside clinic,Skills lab	Skill assessment/ Short note/ Viva voce			
IM14.9	Order and interpret diagnostic tests based on the clinical diagnosis including blood glucose, lipids, thyroid function tests etc.	S	SH	Y	Bedside clinic, Skills lab, Small group discussion	Skill assessment/ Short note/ Viva voce			
IM14.10	Describe the indications and interpret the results of tests for secondary causes of obesity	K	KH	Y	Bedside clinic, Skills lab, Small group discussion	Skill assessment/ Short note/ Viva voce			
IM14.11	Communicate and counsel patient on behavioural, dietary and lifestyle modifications	C	SH	Y	Bedside clinic, Skills lab	Skill assessment			
IM14.12	Demonstrate an understanding of patient’s inability to adhere to lifestyle instructions and counsel them in a non - judgemental way	A/C	SH	Y	Bedside clinic, Skills lab	Skill assessment			
IM14.13	Describe and enumerate the indications, pharmacology and side effects of pharmacotherapy for obesity	K	K	Y	Lecture, Small group discussion	Short note/ Viva voce		Pharmacology	
IM14.14	Describe and enumerate the indications and side effects of bariatric surgery	K	K	Y	Lecture, Small group discussion	Short note/ Viva voce			General Surgery

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
IM14.15	Describe and enumerate and educate patients, health care workers and the public on measures to prevent obesity and promote a healthy lifestyle	K	K	Y	Lecture, Small group discussion	Short note/ Viva voce			
Topic: GI bleeding		**Number of competencies: (18)**				**Number of procedures that require certification : (NIL)**			
IM15.1	Enumerate, describe and discuss the aetiology of upper and lower GI bleeding	K	KH	Y	Lecture, Small group discussion	Short note/ Viva voce		Pathology	General Surgery
IM15.2	Enumerate, describe and discuss the evaluation and steps involved in stabilizing a patient who presents with acute volume loss and GI bleed	S	SH	Y	DOAP session, Small group discussion, Lecture	Written/ Viva voce/ Skill assessment		Pathology	General Surgery
IM15.3	Describe and discuss the physiologic effects of acute blood and volume loss	K	K	Y	Lecture, Small group discussion	Short note/ Viva voce		Pathology, Physiology	General Surgery
IM15.4	Elicit and document and present an appropriate history that identifies the route of bleeding, quantity, grade, volume loss, duration, etiology, comorbid illnesses and risk factors	S	SH	Y	Bedside clinic	Skill assessment			General Surgery
IM15.5	Perform, demonstrate and document a physical examination based on the history that includes general examination, volume assessment and appropriate abdominal examination	S	SH	Y	Bedside clinic, Skills lab	Skill assessment			General Surgery
IM15.6	Distinguish between upper and lower gastrointestinal bleeding based on the clinical features	S	KH	Y	Lecture, Small group discussion	Short note/ Viva voce			General Surgery
IM15.7	Demonstrate the correct technique to perform an anal and rectal examination in a mannequin or equivalent	S	SH	Y	DOAP session	Skill assessment			General Surgery
IM15.8	Generate a differential diagnosis based on the presenting symptoms and clinical features and prioritise based on the most likely diagnosis	S	SH	Y	Bedside clinic, Skills lab	Skill assessment/ Short note/ Viva voce			General Surgery
IM15.9	Choose and interpret diagnostic tests based on the clinical diagnosis including complete blood count, PT and PTT, stool examination, occult blood, liver function tests, H.pylori test.	S	SH	Y	Bedside clinic, DOAP session, Small group discussion	Skill assessment/ Short note/ Viva voce		Pathology	General Surgery

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
IM15.10	Enumerate the indications for endoscopy, colonoscopy and other imaging procedures in the investigation of Upper GI bleeding	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			General Surgery
IM15.11	Develop, document and present a treatment plan that includes fluid resuscitation, blood and blood component transfusion, and specific therapy for arresting blood loss	S	KH	Y	Lecture, Small group discussion	Short note/ Viva voce		Pathology	General Surgery
IM15.12	Enumerate the indications for whole blood, component and platelet transfusion and describe the clinical features and management of a mismatched transfusion	K	K	Y	Lecture, Small group discussion	Short note/ Viva voce		Pathology	General Surgery
IM15.13	Observe cross matching and blood / blood component transfusion	S	SH	Y	Bedside clinic	Short note/ Viva voce/ Skill assessment		Pathology	General Surgery
IM15.14	Describe and enumerate the indications, pharmacology and side effects of pharmacotherapy of pressors used in the treatment of Upper GI bleed	K	K	Y	Lecture, Small group discussion	Short note/Viva voce		Pharmacology	General Surgery
IM15.15	Describe and enumerate the indications, pharmacology and side effects of pharmacotherapy of acid peptic disease including Helicobacter pylori	K	K	Y	Lecture, Small group discussion	Short note/ Viva voce		Pharmacology, Microbiology	General Surgery
IM15.16	Enumerate the indications for endoscopic interventions and Surgery	K	K	Y	Lecture, Small group discussion	Short note/ Viva voce			General Surgery
IM15.17	Determine appropriate level of specialist consultation	S	K	Y	Small group discussion				General Surgery
IM15.18	Counsel the family and patient in an empathetic non-judgmental manner on the diagnosis and therapeutic options	S	SH	Y	DOAP session	Skill assessment			General Surgery
Topic: Diarrheal disorder		**Number of competencies: (17)**				**Number of procedures that require certification : (NIL)**			
IM16.1	Describe and discuss the aetiology of acute and chronic diarrhea including infectious and non infectious causes	K	K	Y	Lecture, Small group discussion	Short note/ Viva voce		Microbiology	
IM16.2	Describe and discuss the acute systemic consequences of diarrhea including its impact on fluid balance	K	K	Y	Lecture, Small group discussion	Short note/ Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
IM16.3	Describe and discuss the chronic effects of diarrhea including malabsorption	K	K	Y	Lecture, Small group discussion	Short note/ Viva voce			
IM16.4	Elicit and document and present an appropriate history that includes the natural history, dietary history, travel , sexual history and other concomitant illnesses	S	SH	Y	Bedside clinic, Skills lab	Skill assessment		Microbiology, Pathology	
IM16.5	Perform, document and demonstrate a physical examination based on the history that includes general examination, including an appropriate abdominal examination	S	SH	Y	Bedside clinic, Skills lab	Skill assessment			
IM16.6	Distinguish between diarrhea and dysentery based on clinical features	S	KH	Y	Lecture, Small group discussion	Short note/ Viva voce			
IM16.7	Generate a differential diagnosis based on the presenting symptoms and clinical features and prioritise based on the most likely diagnosis	S	SH	Y	Bedside clinic, Skills lab	Skill assessment/ short note/ Viva voce			
IM16.8	Choose and interpret diagnostic tests based on the clinical diagnosis including complete blood count, and stool examination	S	SH	Y	Bedside clinic, Skills lab, Small group discussion	Skill assessment/ Short note/ Viva voce		Microbiology, Pathology	
IM16.9	Identify common parasitic causes of diarrhea under the microscope in a stool specimen	S	SH	Y	DOAP session	Skill assessment		Microbiology	
IM16.10	Identify vibrio cholera in a hanging drop specimen	S	SH	Y	DOAP session	Skill Assessment		Microbiology	
IM16.11	Enumerate the indications for stool cultures and blood cultures in patients with acute diarrhea	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology	
IM16.12	Enumerate and discuss the indications for further investigations including antibodies, colonoscopy, diagnostic imaging and biopsy in the diagnosis of chronic diarrhea	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	General Surgery
IM16.13	Describe and enumerate the indications, pharmacology and side effects of pharmacotherapy for parasitic causes of diarrhea	K	K	Y	Lecture, Small group discussion	Short note/ Viva voce		Pharmacology, Microbiology	
IM16.14	Describe and enumerate the indications, pharmacology and side effects of pharmacotherapy for bacterial and viral diarrhea	K	K	Y	Lecture, Small group discussion	Short note/ Viva voce		Pharmacology, Microbiology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
IM16.15	Distinguish based on the clinical presentation Crohn's disease from Ulcerative Colitis	S	SH	Y	Lecture, Small group discussion	Short note/ Viva voce		Pathology	General Surgery
IM16.16	Describe and enumerate the indications, pharmacology and side effects of pharmacotherapy including immunotherapy	K	K	Y	Lecture, Small group discussion	Short note/ Viva voce		Pharmacology	
IM16.17	Describe and enumerate the indications for surgery in inflammatory bowel disease	K	K	Y	Lecture, Small group discussion	Short note/ Viva voce			General Surgery
Topic: Headache		**Number of competencies: (14)**				**Number of procedures that require certification : (NIL)**			
IM17.1	Define and classify headache and describe the presenting features, precipitating factors, aggravating and relieving factors of various kinds of headache	K	KH	Y	Lecture, Small group discussion	Short note/ Viva voce		Human Anatomy	
IM17.2	Elicit and document and present an appropriate history including aura, precipitating aggravating and relieving factors, associated symptoms that help identify the cause of headaches	S	SH	Y	Bedside clinic, Small group discussion	Bedside clinic/ Skill assessment			
IM17.3	Classify migraine and describe the distinguishing features between classical and non classical forms of migraine	K	KH	Y	Bedside clinic, Small group discussion	Bedside clinic/ Skill assessment			
IM17.4	Perform and demonstrate a general neurologic examination and a focused examination for signs of intracranial tension including neck signs of meningitis	S	SH	Y	Bedside clinic, Small group discussion	Bedside clinic/ Skill assessment			
IM17.5	Generate document and present a differential diagnosis based on the clinical features, and prioritise the diagnosis based on the presentation	S	SH	Y	Bedside clinic,Small group discussion	Bedside clinic/ skill assessment			
IM17.6	Choose and interpret diagnostic testing based on the clinical diagnosis including imaging	S	SH	Y	Lecture, Small group discussion, Bedside clinic	Skill Assessment			
IM17.7	Enumerate the indications and describe the findings in the CSF in patients with meningitis	K	K	Y	Small group discussion, Bedside clinic	Skill Assessment		Microbiology, Pathology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
IM17.8	Demonstrate in a mannequin or equivalent the correct technique for performing a lumbar puncture	S	SH	Y	DOAP session	Skill assessment		Microbiology, Pathology	
IM17.9	Interpret the CSF findings when presented with various parameters of CSF fluid analysis	S	SH	Y	Small group discussion, Bedside clinic	Skill assessment		Microbiology, Pathology	
IM17.10	Enumerate the indications for emergency care admission and immediate supportive care in patients with headache	K	K	Y	Lecture, Small group discussion	Written/ Viva voce			
IM17.11	Describe the indications, pharmacology, dose, side effects of abortive therapy in migraine	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
IM17.12	Describe the indications, pharmacology, dose, side effects of prophylactic therapy in migraine	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
IM17.13	Describe the pharmacology, dose, adverse reactions and regimens of drugs used in the treatment of bacterial, tubercular and viral meningitis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
IM17.14	Counsel patients with migraine and tension headache on lifestyle changes and need for prophylactic therapy	A/C	SH	N	DOAP session	Skill Assessment		Pharmacology	Psychiatry
Topic: Cerebrovascular accident		**Number of competencies: (17)**				**Number of procedures that require certification : (NIL)**			
IM18.1	Describe the functional and the vascular anatomy of the brain	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy	
IM18.2	Classify cerebrovascular accidents and describe the aetiology, predisposing genetic and risk factors pathogenesis of hemorrhagic and non hemorrhagic stroke	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
IM18.3	Elicit and document and present an appropriate history including onset, progression, precipitating and aggravating relieving factors, associated symptoms that help identify the cause of the cerebrovascular accident	S	SH	Y	Bedside clinic	Skill assessment		Pathology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
IM18.4	Identify the nature of the cerebrovascular accident based on the temporal evolution and resolution of the illness	K	KH	Y	Bedside clinic, Small group discussion	Skill Assessment			
IM18.5	Perform, demonstrate & document physical examination that includes general and a detailed neurologic examination as appropriate, based on the history	S	SH	Y	Bedside clinic, DOAP session	Skill Assessment			
IM18.6	Distinguish the lesion based on upper vs lower motor neuron, side, site and most probable nature of the lesion	K/S	SH	Y	Bedside clinic, DOAP session	Skill Assessment		Physiology	
IM18.7	Describe the clinical features and distinguish, based on clinical examination, the various disorders of speech	K/S	SH	N	Bedside clinic, DOAP session	Skill Assessment		Physiology	
IM18.8	Describe and distinguish, based on the clinical presentation, the types of bladder dysfunction seen in CNS disease	K	KH	Y	Small group discussion, Bedside clinic	Written/ Viva voce		Physiology	
IM18.9	Choose and interpret the appropriate diagnostic and imaging test that will delineate the anatomy and underlying cause of the lesion	S	KH	Y	Bedside clinic, DOAP session, Small group discussion	Written/ Viva voce/ Skill assessment		Radiodiagnosis	
IM18.10	Choose and interpret the appropriate diagnostic testing in young patients with a cerebrovascular accident (CVA)	S	SH	Y	Lecture, Small group discussion	Written/ Viva voce			
IM18.11	Describe the initial supportive management of a patient presenting with a cerebrovascular accident (CVA)	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
IM18.12	Enumerate the indications for and describe acute therapy of non hemorrhagic stroke including the use of thrombolytic agents	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
IM18.13	Enumerate the indications for and describe the role of anti platelet agents in non hemorrhagic stroke	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
IM18.14	Describe the initial management of a hemorrhagic stroke	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
IM18.15	Enumerate the indications for surgery in a hemorrhagic stroke	K	K	Y	Lecture, Small group discussion	Written/ Viva voce			General Surgery

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
IM18.16	Enumerate the indications describe and observe the multidisciplinary rehabilitation of patients with a CVA	S	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Physical Medicine & Rehabilitation
IM18.17	Counsel patient and family about the diagnosis and therapy in an empathetic manner	A/C	SH	Y	DOAP session	Skill assessment			
Topic: Movement disorders		**Number of competencies: (09)**				**Number of procedures that require certification : (NIL)**			
IM19.1	Describe the functional anatomy of the locomotor system of the brain	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy, Physiology	
IM19.2	Classify movement disorders of the brain based on distribution, rhythm, repetition, exacerbating and relieving factors	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
IM19.3	Elicit and document and present an appropriate history including onset, progression precipitating and aggravating relieving factors, associated symptoms that help identify the cause of the movement disorders	S	SH	Y	Bedside clinic	Skill assessment			
IM19.4	Perform, demonstrate and document a physical examination that includes a general examination and a detailed neurologic examination using standard movement rating scales	S	SH	Y	Bedside clinic	Skill assessment			
IM19.5	Generate document and present a differential diagnosis and prioritise based on the history and physical examination	S	SH	Y	Bedside clinic	Skill assessment			
IM19.6	Make a clinical diagnosis regarding on the anatomical location, nature and cause of the lesion based on the clinical presentation and findings	S	SH	Y	Bedside clinic	Skill assessment			
IM19.7	Choose and interpret diagnostic and imaging tests in the diagnosis of movement disorders	S	SH	Y	Bedside clinic, Small group session	Skill assessment/ Written/ Viva voce		Radiodiagnosis	
IM19.8	Discuss and describe the pharmacology, dose, side effects and interactions used in the drug therapy of Parkinson's syndrome	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
IM19.9	Enumerate the indications for use of surgery and botulinum toxin in the treatment of movement disorders	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	General Surgery

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
Topic: Envenomation		**Number of competencies: (09)**				**Number of procedures that require certification : (NIL)**			
IM20.1	Enumerate the local poisonous snakes and describe the distinguishing marks of each	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Forensic Medicine, Pharmacology	
IM20.2	Describe, demonstrate in a volunteer or a mannequin and educate (to other health care workers / patients) the correct initial management of patient with a snake bite in the field	S	SH	Y	DOAP session	Skill assessment/ Written/ Viva voce		Forensic Medicine	
IM20.3	Describe the initial approach to the stabilisation of the patient who presents with snake bite	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Forensic Medicine	
IM20.4	Elicit and document and present an appropriate history, the circumstance, time, kind of snake, evolution of symptoms in a patient with snake bite	S	SH	Y	Bedside clinic, DOAP session	Skill assessment		Forensic Medicine	
IM20.5	Perform a systematic examination, document and present a physical examination that includes general examination, local examination, appropriate cardiac and neurologic examination	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			
IM20.6	Choose and interpret the appropriate diagnostic testing in patients with snake bites	S	SH	Y	Small group discussion	Written/ Viva voce			
IM20.7	Enumerate the indications and describe the pharmacology, dose, adverse reactions, hypersensitivity reactions of anti snake venom	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
IM20.8	Describe the diagnosis, initial approach stabilisation and therapy of scorpion envenomation	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
IM20.9	Describe the diagnosis initial approach stabilisation and therapy of bee sting allergy	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
Topic: Poisoning		**Number of competencies: (08)**				**Number of procedures that require certification : (NIL)**			
IM21.1	Describe the initial approach to the stabilisation of the patient who presents with poisoning	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
IM21.2	Enumerate the common plant poisons seen in your area and describe their toxicology, clinical features, prognosis and specific approach to detoxification	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Forensic Medicine, Pharmacology	
IM21.3	Enumerate the common corrosives used in your area and describe their toxicology, clinical features, prognosis and approach to therapy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Forensic Medicine, Pharmacology	
IM21.4	Enumerate the commonly observed drug overdose in your area and describe their toxicology, clinical features, prognosis and approach to therapy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Forensic Medicine, Pharmacology	
IM21.5	Observe and describe the functions and role of a poison center in suspected poisoning	S	KH	Y	DOAP session	document in log book		Forensic Medicine, Pharmacology	
IM21.6	Describe the medico legal aspects of suspected suicidal or homicidal poisoning and demonstrate the correct procedure to write a medico legal report on a suspected poisoning	S	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce/ Skill assessment		Forensic Medicine, Pharmacology	
IM21.7	Counsel family members of a patient with suspected poisoning about the clinical and medico legal aspects with empathy	A/C	SH	Y	DOAP session	Skill assessment		Forensic Medicine, Pharmacology	
IM21.8	Enumerate the indications for psychiatric consultation and describe the precautions to be taken in a patient with suspected suicidal ideation / gesture	K	KH	Y	DOAP session	Skill assessment		Forensic Medicine, Psychiatry	
Topic: Mineral, Fluid Electrolyte and Acid base Disorder		**Number of competencies: (13)**				**Number of procedures that require certification : (NIL)**			
IM22.1	Enumerate the causes of hypercalcemia and distinguish the features of PTH vs non PTH mediated hypercalcemia	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM22.2	Describe the aetiology, clinical manifestations, diagnosis and clinical approach to primary hyperparathyroidism	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Pathology	General Surgery
IM22.3	Describe the approach to the management of hypercalcemia	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
IM22.4	Enumerate the components and describe the genetic basis of the multiple endocrine neoplasia syndrome	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Pathology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
IM22.5	Enumerate the causes and describe the clinical features and the correct approach to the diagnosis and management of the patient with hyponatremia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
IM22.6	Enumerate the causes and describe the clinical and laboratory features and the correct approach to the diagnosis and management of the patient with hyponatremia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
IM22.7	Enumerate the causes and describe the clinical and laboratory features and the correct approach to the diagnosis and management of the patient with hypokalemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
IM22.8	Enumerate the causes and describe the clinical and laboratory features and the correct approach to the diagnosis and management of the patient with hyperkalemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
IM22.9	Enumerate the causes and describe the clinical and laboratory features of metabolic acidosis	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Physiology	
IM22.10	Enumerate the causes of describe the clinical and laboratory features of metabolic alkalosis	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Physiology	
IM22.11	Enumerate the causes and describe the clinical and laboratory features of respiratory acidosis	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Physiology	
IM22.12	Enumerate the causes and describe the clinical and laboratory features of respiratory alkalosis	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Physiology	
IM22.13	Identify the underlying acid based disorder based on an ABG report and clinical situation	S	KH	N	Lecture, Small group discussion	Written/ Viva voce		Physiology	
Topic: Nutritional and Vitamin Deficiencies		**Number of competencies: (05)**				**Number of procedures that require certification: (NIL)**			
IM23.1	Discuss and describe the methods of nutritional assessment in an adult and calculation of caloric requirements during illnesses	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry	Pediatrics
IM23.2	Discuss and describe the causes and consequences of protein caloric malnutrition in the hospital	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry	Pediatrics

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
IM23.3	Discuss and describe the aetiology, causes, clinical manifestations, complications, diagnosis and management of common vitamin deficiencies	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry	Pediatrics
IM23.4	Enumerate the indications for enteral and parenteral nutrition in critically ill patients	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry	Pediatrics
IM23.5	Counsel and communicate to patients in a simulated environment with illness on an appropriate balanced diet	S	SH	Y	DOAP session	Skill assessment			
Topic: Geriatrics		**Number of competencies: (22)**				**Number of procedures that require certification : (NIL)**			
IM24.1	Describe and discuss the epidemiology, pathogenesis, clinical evolution, presentation and course of common diseases in the elderly	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
IM24.2	Perform multidimensional geriatric assessment that includes medical, psycho-social and functional components	S	SH	Y	Bedside clinic, DOAP session	Skill assessment		Psychiatry	
IM24.3	Describe and discuss the aetiopathogenesis,clinical presentation, identification, functional changes, acute care, stabilization, management and rehabilitation of acute confusional states	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
IM24.4	Describe and discuss the aetiopathogenesis,clinical presentation, identification, functional changes, acute care, stabilization, management and rehabilitation of vascular events in the elderly	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
IM24.5	Describe and discuss the aetiopathogenesis,clinical presentation, identification, functional changes, acute care, stabilization, management and rehabilitation of depression in the elderly	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Psychiatry
IM24.6	Describe and discuss the aetiopathogenesis causes, clinical presentation, difference in discussion presentation identification, functional changes, acute care, stabilization, management and rehabilitation of dementia in the elderly	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			AETCOM

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
IM24.7	Describe and discuss the aetiopathogenesis,clinical presentation, identification, functional changes, acute care, stabilization, management and rehabilitation of personality changes in the elderly	K	KH	N	Lecture, Small group discussion	Written/ Viva voce			Psychiatry
IM24.8	Describe and discuss the aetiopathogenesis,clinical presentation, identification, functional changes, acute care, stabilization, management and rehabilitation of osteoporosis in the elderly	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
IM24.9	Describe and discuss the aetiopathogenesis,clinical presentation, identification, functional changes, acute care, stabilization, management and rehabilitation of CVA in the elderly	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
IM24.10	Describe and discuss the aetiopathogenesis,clinical presentation, identification, functional changes, acute care, stabilization, management and rehabilitation of COPD in the elderly	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Respiratory Medicine
IM24.11	Describe and discuss the aetiopathogenesis,clinical presentation, identification, functional changes, acute care, stabilization, management and rehabilitation of the elderly undergoing surgery	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Anesthesiology, General Surgery
IM24.12	Describe and discuss the aetiopathogenesis,clinical presentation, identification, functional changes, acute care, stabilization, management and rehabilitation of degenerative joint disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Orthopedics
IM24.13	Describe and discuss the aetiopathogenesis,clinical presentation, identification, functional changes, acute care, stabilization, management and rehabilitation of falls in the elderly	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Orthopedics, Physical Medicine & Rehabilitation
IM24.14	Describe and discuss the aetiopathogenesis,clinical presentation, identification, functional changes, acute care, stabilization, management and rehabilitation of common fractures in the elderly	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Orthopedics
IM24.15	Describe and discuss the aetiopathogenesis,clinical presentation, identification, functional changes, acute care, stabilization, management and rehabilitation of vision and visual loss in the elderly	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Ophthalmology

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
IM24.16	Describe and discuss the principles of physical and social rehabilitation, functional assessment, role of physiotherapy and occupational therapy in the management of disability in the elderly	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Orthopedics, Physical Medicine & Rehabilitation
IM24.17	Describe and discuss the aetiopathogenesis,clinical presentation, identification, functional changes, acute care, stabilization, management and rehabilitation of hearing loss in the elderly	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			ENT
IM24.18	Describe the impact of the demographic changes in ageing on the population	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine	
IM24.19	Enumerate and describe the social problems in the elderly including isolation, abuse, change in family structure and their impact on health.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Psychiatry
IM24.20	Enumerate and describe social interventions in the care of elderly including domiciliary discussion services, rehabilitation facilities, old age homes and state interventions	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
IM24.21	Enumerate and describe ethical issues in the care of the elderly	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			AETCOM
IM24.22	Describe and discuss the aetiopathogenesis, clinical presentation, complications, assessment and management of nutritional disorders in the elderly	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry	
Topic: Miscellaneous Infections		**Number of competencies: (13)**				**Number of procedures that require certification : (NIL)**			
IM25.1	Describe and discuss the response and the influence of host immune status, risk factors and comorbidities on zoonotic diseases (e.g. Leptospirosis, Rabies) and non-febrile infectious disease (e.g. Tetanus)	K	K	Y	Lecture, Small group discussion	Written		Microbiology, Community Medicine	
IM25.2	Discuss and describe the common causes, pathophysiology and manifestations of these diseases	K	K	Y	Lecture, Small group discussion	Written		Microbiology, Community Medicine	
IM25.3	Describe and discuss the pathophysiology and manifestations of these diseases	K	KH	Y	Lecture, Small group discussion	Written		Microbiology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
IM25.4	Elicit document and present a medical history that helps delineate the aetiology of these diseases that includes the evolution and pattern of symptoms, risk factors, exposure through occupation and travel	S	SH	Y	Bedside clinic, DOAP session	Skill assessment		Community Medicine	
IM25.5	Perform a systematic examination that establishes the diagnosis and severity of presentation that includes: general skin, mucosal and lymph node examination, chest and abdominal examination (including examination of the liver and spleen)	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			
IM25.6	Generate a differential diagnosis and prioritise based on clinical features that help distinguish between infective, inflammatory, malignant and rheumatologic causes	K	SH	Y	Bedside clinic, DOAP session	Written/ Viva voce			
IM25.7	Order and interpret diagnostic tests based on the differential diagnosis including: CBC with differential, blood biochemistry, peripheral smear, urinary analysis with sediment, Chest X ray, blood and urine cultures, sputum gram stain and cultures, sputum AFB and cultures, CSF analysis, pleural and body fluid analysis, stool routine and culture and QBC	K	SH	Y	Bedside clinic, Skill assessment	Skill assessment		Pathology, Microbiology	
IM25.8	Enumerate the indications for use of newer techniques in the diagnosis of these infections	K	KH	N	Lecture, Small group discussion	Written/ Viva voce			
IM25.9	Assist in the collection of blood and other specimen cultures	S	SH	Y	DOAP session	Log book documentation		Microbiology	
IM25.10	Develop and present an appropriate diagnostic plan based on the clinical presentation, most likely diagnosis in a prioritised and cost effective manner	K	KH	Y	Bedside clinic, Skill assessment	Skill assessment			
IM25.11	Develop an appropriate empiric treatment plan based on the patient’s clinical and immune status pending definitive diagnosis	C	SH	Y	DOAP session	Skill assessment		Microbiology, Pharmacology	
IM25.12	Communicate to the patient and family the diagnosis and treatment of identified infection	C	SH	Y	DOAP session	Skill assessment		AETCOM	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
IM25.13	Counsel the patient and family on prevention of various infections due to environmental issues	C	SH	Y	DOAP session	Skill assessment		Community Medicine, General Medicine	
Topic: The role of the physician in the community		**Number of competencies: (49)**				**Number of procedures that require certification : (NIL)**			
IM26.1	Enumerate and describe professional qualities and roles of a physician	K	KH	Y	Small group discussion	Written/ Viva voce			
IM26.2	Describe and discuss the commitment to lifelong learning as an important part of physician growth	K	KH	Y	Small group discussion	Written/ Viva voce			
IM26.3	Describe and discuss the role of non maleficence as a guiding principle in patient care	K	KH	Y	Small group discussion	Written/ Viva voce			
IM26.4	Describe and discuss the role of autonomy and shared responsibility as a guiding principle in patient care	K	KH	Y	Small group discussion	Written/ Viva voce			
IM26.5	Describe and discuss the role of beneficence of a guiding principle in patient care	K	KH	Y	Small group discussion	Written/ Viva voce			
IM26.6	Describe and discuss the role of a physician in health care system	K	KH	Y	Small group discussion	Written/ Viva voce			
IM26.7	Describe and discuss the role of justice as a guiding principle in patient care	K	KH	Y	Small group discussion	Written/ Viva voce			
IM26.8	Identify discuss medicolegal, socioeconomic and ethical issues as it pertains to organ donation	K	KH	Y	Small group discussion	Written/ Viva voce			
IM26.9	Identify, discuss and defend medicolegal, sociocultural, economic and ethical issues as it pertains to rights, equity and justice in access to health care	K	KH	Y	Small group discussion	Written/ Viva voce			
IM26.10	Identify, discuss and defend medicolegal, socio-cultural and ethical issues as it pertains to confidentiality in patient care	K	KH	Y	Small group discussion	Written/ Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
IM26.11	Identify, discuss and defend medicolegal, socio-cultural and ethical issues as it pertains to patient autonomy, patient rights and shared responsibility in health care	K	KH	Y	Small group discussion	Written/ Viva voce			
IM26.12	Identify, discuss and defend medicolegal, socio-cultural and ethical issues as it pertains to decision making in health care including advanced directives and surrogate decision making	K	KH	Y	Small group discussion	Written/ Viva voce			
IM26.13	Identify, discuss and defend medicolegal, socio-cultural and ethical issues as it pertains to decision making in emergency care including situations where patients do not have the capability or capacity to give consent	K	KH	Y	Small group discussion	Written/ Viva voce			
IM26.14	Identify, discuss and defend medicolegal, socio-cultural and ethical issues as it pertains to research in human subjects	K	KH	Y	Small group discussion	Written/ Viva voce			
IM26.15	Identify, discuss and defend, medicolegal,socio-cultural and ethical issues as they pertain to consent for surgical procedures	K	KH	Y	Small group discussion	Written/ Viva voce			
IM26.16	Identify, discuss and defend medicolegal, socio-cultural, professional and ethical issues as it pertains to the physician patient relationship (including fiduciary duty)	K	KH	Y	Small group discussion	Written/ Viva voce			
IM26.17	Identify, discuss physician's role and responsibility to society and the community that she/ he serves	K	KH	Y	Small group discussion	Written/ Viva voce			
IM26.18	Identify, discuss and defend medicolegal, socio-cultural, professional and ethical issues in physician- industry relationships	K	KH	Y	Small group discussion	Written/ Viva voce			
IM26.19	Demonstrate ability to work in a team of peers and superiors	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			
IM26.20	Demonstrate ability to communicate to patients in a patient, respectful, non threatening, non judgemental and empathetic manner	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			
IM26.21	Demonstrate respect to patient privacy	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
IM26.22	Demonstrate ability to maintain confidentiality in patient care	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			
IM26.23	Demonstrate a commitment to continued learning	S	SH	Y	Small group discussion	Skill assessment/ Viva voce			
IM26.24	Demonstrate respect in relationship with patients, fellow team members, superiors and other health care workers	S	SH	Y	Bedside clinic, DOAP session	Skill assessment/ Viva voce			
IM26.25	Demonstrate responsibility and work ethics while working in the health care team	S	SH	Y	Bedside clinic, DOAP session	Skill assessment/ Viva voce			
IM26.26	Demonstrate ability to maintain required documentation in health care (including correct use of medical records)	S	SH	Y	Small group discussion	Skill assessment/ Viva voce			
IM26.27	Demonstrate personal grooming that is adequate and appropriate for health care responsibilities	S	SH	Y	Small group discussion	Skill assessment			
IM26.28	Demonstrate adequate knowledge and use of information technology that permits appropriate patient care and continued learning	S	SH	Y	Small group discussion	Skill assessment/ Viva voce			
IM26.29	Communicate diagnostic and therapeutic opitons to patient and family in a simulated environment	S	SH	Y	Bedside clinic, DOAP session	Skill assessment/ Viva voce			
IM26.30	Communicate care opitons to patient and family with a terminal illness in a simulated environment	S	SH	Y	Bedside clinic, DOAP session	Skill assessment/ Viva voce			
IM26.31	Demonstrate awareness of limitations and seeks help and consultations appropriately	S	SH	Y	Bedside clinic, DOAP session	Skill assessment/ Viva voce			
IM26.32	Demonstrate appropriate respect to colleagues in the profession	S	SH	N	Small group discussion	Skill assessment/ Viva voce			
IM26.33	Demonstrate an understanding of the implications and the appropriate procedures and response to be followed in the event of medical errors	S	SH	N	Small group discussion	Skill assessment/ Viva voce			
IM26.34	Identify conflicts of interest in patient care and professional relationships and describe the correct response to these conflicts	S	SH	Y	Small group discussion	Skill assessment/ Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
IM26.35	Demonstrate empathy in patient encounters	S	SH	Y	Bedside clinic, DOAP session	Skill assessment/ Viva voce			
IM26.36	Demonstrate ability to balance personal and professional priorities	S	SH	N	Small group discussion	Skill assessment/ Viva voce			
IM26.37	Demonstrate ability to manage time appropriately	S	SH	Y	Small group discussion	Skill assessment/ Viva voce			
IM26.38	Demonstrate ability to form and function in appropriate professional networks	S	SH	N	Small group discussion	Skill assessment/ Viva voce			
IM26.39	Demonstrate ability to pursue and seek career advancement	S	SH	N	Small group discussion	Skill assessment/ Viva voce			
IM26.40	Demonstrate ability to follow risk management and medical error reduction practices where appropriate	S	SH	N	Small group discussion	Skill assessment/ Viva voce			
IM26.41	Demonstrate ability to work in a mentoring relationship with junior colleagues	S	SH	N	Small group discussion	Skill assessment/ Viva voce			
IM26.42	Demonstrate commitment to learning and scholarship	S	SH	N	Small group discussion	Skill assessment/ Viva voce			
IM26.43	Identify, discuss and defend medicolegal, sociocultural, economic and ethical issues as they pertain to in vitro fertilisation donor insemination and surrogate motherhood	K	KH	N	Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology	
IM26.44	Identify, discuss and defend medicolegal, socio-cultural professional and ethical issues pertaining to medical negligence	K	KH	N	Small group discussion	Written/ Viva voce			
IM26.45	Identify, discuss and defend medicolegal, socio-cultural professional and ethical issues pertaining to malpractice	K	KH	N	Small group discussion	Written/ Viva voce			
IM26.46	Identify, discuss and defend medicolegal, socio-cultural professional and ethical issues in dealing with impaired physicians	K	KH	N	Small group discussion	Written/ Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
IM26.47	Identify, discuss and defend medicolegal, socio-cultural and ethical issues as they pertain to refusal of care including do not resuscitate and withdrawal of life support	K	KH	Y	Small group discussion	Written/ Viva voce			
IM26.48	Demonstrate altruism	S	SH	Y	Small group discussion	Written/ Viva voce			
IM26.49	Administer informed consent and approriately adress patient queries to a patient being enrolled in a research protocol in a simulated environment	S	SH	Y	Bedside clinic, DOAP session	Written/ Viva voce			
	Column C: K- Knowledge, S – Skill, A - Attitude / professionalism, C- Communication. **Column D: K – Knows, KH - Knows How, SH - Shows how, P- performs independently,** **Column F: DOAP session – Demonstrate, Observe, Assess, Perform.** **Column H: If entry is P: indicate how many procedures must be done independently for certification/ graduation**								
Integration									
	Human Anatomy								
AN5.6	Describe the concept of anastomoses and collateral circulation with significance of end-arteries	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Physiology
AN7.5	Describe principles of sensory and motor innervation of muscles	K	KH	N	Lecture	Written		General Medicine	Physiology
AN7.6	Describe concept of loss of innervation of a muscle with its applied anatomy	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	
AN20.8	Identify & demonstrate palpation of femoral, popliteal, post tibial, anti tibial & dorsalis pedis blood vessels in a simulated environment	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Viva voce/ Skill assessment		General Medicine	
AN20.9	Identify & demonstrate Palpation of vessels (femoral, popliteal,dorsalis pedis,post tibial), Mid inguinal point, Surface projection of: femoral nerve, Saphenous opening, Sciatic, tibial, common peroneal & deep peroneal nerve, great and small saphenous veins	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Viva voce/ Skill assessment		General Medicine, General Surgery	
AN22.4	Describe anatomical basis of ischaemic heart disease	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Physiology

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN22.7	Mention the parts, position and arterial supply of the conducting system of heart	K	KH	Y	Lecture	Written		General Medicine	Physiology
AN24.1	Mention the blood supply, lymphatic drainage and nerve supply of pleura, extent of pleura and describe the pleural recesses and their applied anatomy	K	KH	Y	Practical, Lecture	Written/ Viva voce		General Medicine	Physiology
AN24.2	Identify side, external features and relations of structures which form root of lung & bronchial tree and their clinical correlate	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ Skill assessment		General Medicine	Physiology
AN24.3	Describe a bronchopulmonary segment	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Physiology
AN25.3	Describe fetal circulation and changes occurring at birth	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Physiology
AN25.4	Describe embryological basis of: 1) atrial septal defect, 2)ventricular septal defect, 3) Fallot's tetralogy & 4) tracheo-oesophageal fistula	K	KH	Y	Lecture	Written/ Viva voce		General Medicine, Pediatrics	Physiology
AN25.5	Describe developmental basis of congenital anomalies, transposition of great vessels, dextrocardia, patent ductus arteriosus and coarctation of aorta	K	KH	Y	Lecture	Written/ Viva voce		General Medicine, Pediatrics	Physiology
AN25.7	Identify structures seen on a plain x-ray chest (PA view)	K/S	SH	Y	Practical, DOAP session	Written/ Viva voce		Radiodiagnosis, General Medicine	
AN25.8	Identify and describe in brief a barium swallow	K/S	SH	N	Practical, DOAP session	Written/ Viva voce		Radiodiagnosis, General Medicine	
AN25.9	Demonstrate surface marking of lines of pleural reflection, Lung borders and fissures, Trachea, Heart borders, Apex beat & Surface projection of valves of heart	K/S	SH	Y	Practical	Viva voce/ Skill assessment		General Medicine, Pediatrics	Physiology
AN28.7	Explain the anatomical basis of facial nerve palsy	K	KH	Y	Lecture	Written		General Medicine	
AN50.3	Describe lumbar puncture (site, direction of the needle, structures pierced during the lumbar puncture)	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN56.1	Describe & identify various layers of meninges with its extent & modifications	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ Skill assessment		General Medicine	
AN56.2	Describe circulation of CSF with its applied anatomy	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Physiology
AN57.4	Enumerate ascending & descending tracts at mid thoracic level of spinal cord	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Physiology
AN57.5	Describe anatomical basis of syringomyelia	K	KH	N	Lecture	Written		General Medicine	Physiology
AN58.4	Describe anatomical basis & effects of medial & lateral medullary syndrome	K	KH	N	Lecture	Written		General Medicine	Physiology
AN60.3	Describe anatomical basis of cerebellar dysfunction	K	KH	N	Lecture	Written		General Medicine	Physiology
AN61.3	Describe anatomical basis & effects of Benedict's and Weber's syndrome	K	KH	N	Lecture	Written		General Medicine	Physiology
AN62.2	Describe & demonstrate surfaces, sulci, gyri, poles, & functional areas of cerebral hemisphere	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ Skill assessment		General Medicine	Physiology
AN62.3	Describe the white matter of cerebrum	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Physiology
AN62.5	Describe boundaries, parts, gross relations, major nuclei and connections of dorsal thalamus, hypothalamus, epithalamus, metathalamus and subthalamus	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Physiology
AN62.6	Describe & identify formation, branches & major areas of distribution of circle of Willis	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ Skill assessment		General Medicine	Physiology
AN74.1	Describe the various modes of inheritance with examples	K	KH	Y	Lecture	Written		General Medicine, Pediatrics	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN74.2	Draw pedigree charts for the various types of inheritance & give examples of diseases of each mode of inheritance	K	KH	Y	Lecture	Written		General Medicine, Pediatrics	
AN74.3	Describe multifactorial inheritance with examples	K	KH	Y	Lecture	Written		General Medicine	
AN74.4	Describe the genetic basis & clinical features of Achondroplasia, Cystic Fibrosis, Vitamin D resistant rickets, Hemophilia, Duchene's muscular dystrophy & Sickle cell anaemia	K	KH	N	Lecture	Written		General Medicine, Pediatrics	
Physiology									
PY3.12	Explain the gradation of muscular activity	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PY3.13	Describe muscular dystrophy: myopathies	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Human Anatomy
PY4.9	Discuss the physiology aspects of: peptic ulcer, gastro-oesophageal reflux disease, vomiting, diarrhoea, constipation, Adynamic ileus, Hirschsprung's disease	S	SH	Y	Lecture, Small group discussion	Practical/ Viva voce		General Medicine	Biochemistry
PY5.5	Describe the physiology of electrocardiogram (E.C.G), its applications and the cardiac axis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PY5.6	Describe abnormal ECG, arrythmias, heart block and myocardial Infarction	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Human Anatomy
PY5.10	Describe & discuss regional circulation including microcirculation, lymphatic circulation, coronary, cerebral, capillary, skin, foetal, pulmonary and splanchnic circulation	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PY5.13	Record and interpret normal ECG in a volunteer or simulated environment	S	SH	Y	DOAP sessions	Practical/OSPE/Viva voce		General Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
PY5.16	Record Arterial pulse tracing using finger plethysmography in a volunteer or simulated environment	S	SH	N	DOAP sessions, Computer assisted learning methods	Practical/OSPE/Viva voce		General Medicine	
PY7.7	Describe artificial kidney, dialysis and renal transplantation	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		General Medicine	
PY11.14	Demonstrate Basic Life Support in a simulated environment	S	SH	Y	DOAP sessions	OSCE		General Medicine Anaesthesiology	
Biochemistry									
BI2.4	Describe and discuss enzyme inhibitors as poisons and drugs, therapeutic enzymes and the clinical utility of various serum enzymes as markers of pathological conditions	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, General Medicine	
BI2.5	Describe and discuss the clinical utility of various serum enzymes as markers of pathological conditions	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, General Medicine	
BI2.6	Discuss use of enzymes in laboratory investigations (Enzyme-based assays)	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, General Medicine	
BI2.7	Interpret laboratory results of enzyme activities & describe the clinical utility of various enzymes as markers of pathological conditions	K	KH	Y	Lecture, Small group discussion, DOAP sessions	Written/ Viva voce		Pathology, General Medicine	
BI3.4	Define and differentiate the pathways of carbohydrate metabolism (glycolysis, gluconeogenesis, glycogen metabolism, HMP shunt)	K	KH	Y	Lecture,Small group discussion	Written/ Viva voce		General Medicine	
BI3.5	Describe and discuss the regulation, functions and integration of carbohydrate along with associated diseases/disorders	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI3.8	Discuss and interpret laboratory results of analytes associated with metabolism of carbohydrates	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, General Medicine	
BI3.9	Discuss the mechanism and significance of blood glucose regulation in health and disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
BI3.10	Interpret the results of blood glucose levels and other laboratory investigations related to disorders of carbohydrate metabolism	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI4.1	Describe and discuss main classes of lipids (Essential/non-essential fatty acids, cholesterol and hormonal steroids, triglycerides, major phospholipids and sphingolipids) relevant to human system and their major functions	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI4.2	Describe the processes involved in digestion and absorption of dietary lipids and also the key features of their metabolism	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI4.3	Explain the regulation of lipoprotein metabolism & associated disorders	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI4.4	Describe the structure and functions of lipoproteins, their functions, interrelations & relations with atherosclerosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI4.5	Interpret laboratory results of analytes associated with metabolism of lipids	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI4.6	Describe the therapeutic uses of prostaglandins and inhibitors of eicosanoid synthesis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI4.7	Interpret laboratory results of analytes associated with metabolism of lipids	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI5.2	Describe and discuss functions of proteins and structure-function relationships in relevant areas e.g., hemoglobin and selected hemoglobinopathies	K	KH	Y	Lecture, Small group discussion	Viva voce/ Skill assessment		Pathology, General Medicine	Physiology
BI5.5	Interpret laboratory results of analytes associated with metabolism of proteins	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI6.1	Discuss the metabolic processes that take place in specific organs in the body in the fed and fasting states	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI6.4	Discuss the laboratory results of analytes associated with gout & Lesch Nyhan syndrome	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
BI6.5	Describe the biochemical role of vitamins in the body and explain the manifestations of their deficiency	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI6.7	Describe the processes involved in maintenance of normal pH, water & electrolyte balance of body fluids and the derangements associated with these	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Physiology
BI6.8	Discuss and interpret results of Arterial Blood Gas (ABG) analysis in various disorders	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI6.9	Describe the functions of various minerals in the body, their metabolism and homeostasis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Physiology
BI6.10	Enumerate and describe the disorders associated with mineral metabolism	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI6.11	Describe the functions of haem in the body and describe the processes involved in its metabolism and describe porphyrin metabolism	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, General Medicine	Physiology
BI6.12	Describe the major types of haemoglobin and its derivatives found in the body and their physiological/ pathological relevance	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, General Medicine	Physiology
BI6.13	Describe the functions of the kidney, liver, thyroid and adrenal glands	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, General Medicine	Physiology, Human Anatomy
BI6.14	Describe the tests that are commonly done in clinical practice to assess the functions of these organs (kidney, liver, thyroid and adrenal glands)	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, General Medicine	Physiology, Human Anatomy
BI6.15	Describe the abnormalities of kidney, liver, thyroid and adrenal glands.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, General Medicine	Physiology, Human Anatomy
BI7.4	Describe applications of recombinant DNA technology, PCR in the diagnosis and treatment of diseases with genetic basis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics, General Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
BI7.7	Describe the role of oxidative stress in the pathogenesis of conditions such as cancer, complications of diabetes mellitus and atherosclerosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Pathology	
BI8.1	Discuss the importance of various dietary components and explain importance of dietary fibre	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Pediatrics, Pathology	
BI8.2	Describe the types and causes of protein energy malnutrition and its effects	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Pediatrics, Pathology	
BI8.3	Provide dietary advice for optimal health in childhood and adult, in disease conditions like diabetes mellitus, coronary artery disease and in pregnancy.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI8.4	Describe the causes (including dietary habits), effects and health risks associated with being overweight/ obesity	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Pathology	
BI8.5	Summarize the nutritional importance of commonly used items of food including fruits and vegetables (macro-molecules & its importance)	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine, General Medicine, Pediatrics	
BI9.2	Discuss the involvement of ECM components in health and disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI10.4	Describe & discuss innate and adaptive immune responses, self/non-self recognition and the central role of T-helper cells in immune responses	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Pathology	Physiology
BI11.4	Perform urine analysis to estimate and determine normal and abnormal constituents	S	P	Y	Lecture, Small group discussion	Skill assessment	1	General Medicine	Physiology
BI11.5	Describe screening of urine for inborn errors & describe the use of paper chromatography	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
BI11.17	Explain the basis and rationale of biochemical tests done in the following conditions: - diabetes mellitus, - dyslipidemia, - myocardial infarction, - renal failure, gout, - proteinuria, - nephrotic syndrome, - edema, - jaundice, - liver diseases, pancreatitis, disorders of acid- base balance, - thyroid disorders.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine Pathology	
BI11.22	Calculate albumin: globulin (AG) ratio and creatinine clearance	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI11.23	Calculate energy content of different food Items, identify food items with high and low glycemic index and explain the importance of these in the diet	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI11.24	Enumerate advantages and/or disadvantages of use of unsaturated, saturated and trans fats in food.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		General Medicine	
BI1.26	Calculate albumin: globulin (AG) ratio and creatinine clearance	S	SH	Y	Lecture, Small group discussion	Skill assessment		General Medicine	
BI1.27	Calculate energy content of different food Items, identify food items with high and low glycemic index and explain the importance of these in the diet	S	SH	N	Lecture, Small group discussion	Skill assessment		General Medicine	
BI1.28	Enumerate advantages and/or disadvantages of use of unsaturated, saturated and trans fats in food	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		General Medicine	
Pathology									
PA6.1	Define and describe edema its types pathogenesis and clinical correlations	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA9.4	Define autoimmunity. Enumerate autoimmune disorders	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
PA9.5	Define and describe the pathogenesis of systemic lupus erythematosus	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA9.6	Define and describe the pathogenesis and pathology of HIV and AIDS	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
PA9.7	Define and describe the pathogenesis of other common autoimmune diseases	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA10.1	Define and describe the pathogenesis and pathology of malaria	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
PA10.2	Define and describe the pathogenesis and pathology of cysticercosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
PA10.3	Define and describe the pathogenesis and pathology of leprosy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
PA10.4	Define and describe the pathogenesis and pathology of common bacterial, viral, protozoal and helminthic diseases	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
PA12.3	Describe the pathogenesis of obesity and its consequences	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA13.1	Describe hematopoiesis and extramedullary hematopoiesis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA13.2	Describe the role of anticoagulants in hematology	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA13.3	Define and classify anemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA13.4	Enumerate and describe the investigation of anemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA13.5	Perform, Identify and describe the peripheral blood picture in anemia	S	SH	Y	DOAP session	Skill assessment		General Medicine	
PA14.2	Describe the etiology, investigations and differential diagnosis of microcytic hypochromic anemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
PA14.3	Identify and describe the peripheral smear in microcytic anemia	S	SH	Y	DOAP session	Skill assessment		General Medicine	
PA15.1	Describe the metabolism of Vitamin B12 and the etiology and pathogenesis of B12 deficiency	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, General Medicine	
PA15.2	Describe the laboratory investigations of macrocytic anemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA15.4	Enumerate the differences and describe the etiology and distinguishing features of megaloblastic and non-megaloblastic macrocytic anemia	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA16.1	Define and classify hemolytic anemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, General Medicine	
PA16.2	Describe the pathogenesis and clinical features and hematologic indices of hemolytic anemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, General Medicine	
PA16.3	Describe the pathogenesis, features, hematologic indices and peripheral blood picture of sickle cell anemia and thalassemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, General Medicine	
PA16.4	Describe the etiology pathogenesis, hematologic indices and peripheral blood picture of Acquired hemolytic anemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, General Medicine	
PA16.5	Describe indices and peripheral blood smear	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA 17.1	Enumerate the etiology, pathogenesis and findings in aplastic anemia	K	K	N	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA17.2	Enumerate the indications and describe the findings in bone marrow aspiration and biopsy	K	K	N	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA19.6	Enumerate and differentiate the causes of splenomegaly	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery, General Medicine	
PA21.3	Differentiate platelet from clotting disorders based on the clinical and hematologic features	S	SH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
PA21.4	Define and describe disseminated intravascular coagulation, its laboratory findings and diagnosis of disseminated intravascular coagulation	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA21.5	Define and describe disseminated intravascular coagulation its laboratory findings and diagnosis of Vitamin K deficiency	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA22.4	Enumerate blood components and describe their clinical uses	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery, General Medicine	
PA22.6	Describe transfusion reactions and enumerate the steps in the investigation of a transfusion reaction	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA24.2	Describe the etiology, pathogenesis, pathology, microbiology, clinical and microscopic features of peptic ulcer disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA24.3	Describe and identify the microscopic features of peptic ulcer	S	SH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA25.1	Describe bilirubin metabolism, enumerate the etiology and pathogenesis of jaundice, distinguish between direct and indirect hyperbilirubinemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, General Medicine	
PA25.2	Describe the pathophysiology and pathologic changes seen in hepatic failure and their clinical manifestations, complications and consequences	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, General Surgery	
PA25.3	Describe the etiology and pathogenesis of viral and toxic hepatitis: distinguish the causes of hepatitis based on the clinical and laboratory features. Describe the pathology, complications and consequences of hepatitis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA25.4	Describe the pathophysiology, pathology and progression of alcoholic liver disease including cirrhosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, General Surgery	
PA25.5	Describe the etiology, pathogenesis and complications of portal hypertension	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, General Surgery	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
PA25.6	Interpret a liver function and viral hepatitis serology panel. Distinguish obstructive from non obstructive jaundice based on clinical features and liver function tests	S	P	Y	DOAP session	Skill assessment	1	General Medicine	
PA26.1	Define and describe the etiology, types, pathogenesis, stages, morphology and complications of pneumonia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
PA26.2	Describe the etiology, gross and microscopic appearance and complications of lung abscess	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
PA26.3	Define and describe the etiology, types, pathogenesis, stages, morphology and complications and evaluation of Obstructive airway disease (OAD) and bronchiectasis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, General Medicine	Microbiology
PA26.4	Define and describe the etiology, types, pathogenesis, stages, morphology microscopic appearance and complications of tuberculosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
PA26.5	Define and describe the etiology, types, exposure, environmental influence, pathogenesis, stages, morphology, microscopic appearance and complications of Occupational lung disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Community Medicine	
PA26.6	Define and describe the etiology, types, exposure, genetics environmental influence, pathogenesis, stages, morphology, microscopic appearance,metastases and complications of tumors of the lung and pleura	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA26.7	Define and describe the etiology, types, exposure, genetics environmental influence, pathogenesis, morphology, microscopic appearance and complications of mesothelioma	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Community Medicine	
PA27.1	Distinguish arteriosclerosis from atherosclerosis. Describe the pathogenesis and pathology of various causes and types of arteriosclerosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA27.2	Describe the etiology, dynamics, pathology types and complications of aneurysms including aortic aneurysms	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
PA27.3	Describe the etiology, types, stages pathophysiology pathology and complications of heat failure	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Physiology	
PA27.4	Describe the etiology, pathophysiology, pathology, gross and microscopic, features, criteria and complications of rheumatic fever	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
PA27.5	Describe the epidemiology, risk factors, etiology, pathophysiology, pathology, presentations, gross and microscopic, features, diagnostic tests and complications of ischemic heart disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA27.6	Describe the etiology, pathophysiology, pathology, gross and microscopic, features diagnosis and complications of infective endocarditis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
PA27.7	Describe the etiology, pathophysiology, pathology, gross and microscopic, features diagnosis and complications of pericarditis and pericardial effusion	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA27.8	Interpret abnormalities in cardiac function testing in acute coronary syndromes	S	SH	Y	DOAP session	Skill Assessment		Physiology, General Medicine	
PA27.9	Classify and describe the etiology, types, pathophysiology, pathology, gross and microscopic features, diagnosis and complications of cardiomyopathies	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Physiology	
PA27.10	Describe the etiology, pathophysiology, pathology features and complications of syphilis on the cardiovascular system	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
PA28.3	Define and describe the etiology, precipitating factors, pathogenesis, pathology, laboratory urinary findings, progression and complications of acute renal failure	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA28.4	Define and describe the etiology, precipitating factors, pathogenesis, pathology, laboratory urinary findings progression and complications of chronic renal failure	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
PA28.5	Define and classify glomerular diseases. Enumerate and describe the etiology, pathogenesis, mechanisms of glomerular injury, pathology, distinguishing features and clinical manifestations of glomerulonephritis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, General Medicine	
PA28.6	Define and describe the etiology, pathogenesis, pathology, laboratory, urinary findings, progression and complications of IgA nephropathy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA28.7	Enumerate and describe the findings in glomerular manifestations of systemic disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA28.8	Enumerate and classify diseases affecting the tubular interstitium	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA28.9	Define and describe the etiology, pathogenesis, pathology, laboratory, urinary findings, progression and complications of acute tubular necrosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA28.11	Define classify and describe the etiology, pathogenesis pathology, laboratory, urinary findings, distinguishing features, progression and complications of vascular disease of the kidney	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA28.12	Define classify and describe the genetics, inheritance etiology, pathogenesis, pathology, laboratory, urinary findings, distinguishing features, progression and complications of cystic disease of the kidney	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Pediatrics	
PA28.15	Describe the etiology, genetics, pathogenesis, pathology, presenting features and progression of thrombotic angiopathies	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA31.4	Enumerate and describe the etiology, hormonal dependency and pathogenesis of gynecomastia	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Pediatrics, General Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
PA32.1	Enumerate, classify and describe the etiology, pathogenesis, pathology and iodine dependency of thyroid swellings	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy, Physiology, General Medicine, General Surgery	
PA32.2	Describe the etiology, cause, iodine dependency, pathogenesis, manifestations, laboratory and imaging features and course of thyrotoxicosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, General Medicine	
PA32.3	Describe the etiology, pathogenesis, manifestations, laboratory and imaging features and course of thyrotoxicosis/ hypothyroidism	K	KH	Y	Lecture, Small group	Written/ Viva voce		Physiology, General Medicine	
PA32.4	Classify and describe the epidemiology, etiology, pathogenesis, pathology, clinical laboratory features, complications and progression of diabetes mellitus	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, General Medicine	
PA32.5	Describe the etiology, genetics, pathogenesis, manifestations, laboratory and morphologic features of hyperparathyroidism	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Physiology, General Medicine	
PA32.7	Describe the etiology, pathogenesis, manifestations, laboratory, morphologic features, complications of adrenal insufficiency	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Physiology, General Medicine	
PA32.8	Describe the etiology, pathogenesis, manifestations, laboratory, morphologic features, complications of Cushing's syndrome	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Physiology, General Medicine	
PA32.9	Describe the etiology, pathogenesis, manifestations, laboratory and morphologic features of adrenal neoplasms	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy, Physiology, General Medicine, General Surgery	
PA33.5	Classify and describe the etiology, immunology, pathogenesis, manifestations, radiologic and laboratory features, diagnostic criteria and complications of rheumatoid arthritis	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PA35.1	Describe the etiology, types and pathogenesis, differentiating factors, CSF findings in meningitis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
PA35.3	Identify the etiology of meningitis based on given CSF parameters	S	P	Y	DOAP session	Skill Assessment	1	General Medicine	Microbiology
Microbiology									
MI2.1	Describe the etiologic agents in rheumatic fever and their diagnosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Pathology
MI2.2	Describe the classification, etio-pathogenesis, clinical features and discuss the diagnostic modalities of Infective endocarditis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Pathology
MI2.3	Identify the microbial agents causing Rheumatic heart disease & infective Endocarditis	S	SH	Y	DOAP session	Skill assessment		General Medicine	Pathology
MI2.4	List the common microbial agents causing anemia. Describe the morphology, mode of infection and discuss the pathogenesis, clinical course, diagnosis and prevention and treatment of the common microbial agents causing Anemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Pathology
MI2.5	Describe the etio-pathogenesis and discuss the clinical evolution and the laboratory diagnosis of kalazaar, malaria, filariasis and other common parasites prevalent in India	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Pathology
MI2.6	Identify the causative agent of malaria and filariasis	K/S	SH	Y	DOAP session	Skill assessment		General Medicine	
MI2.7	Describe the epidemiology, the etio- pathogenesis evolution complications, opportunistic infections, diagnosis prevention and the principles of management of HIV	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Pathology
MI3.1	Enumerate the microbial agents causing diarrhea and dysentery. Describe the epidemiology, morphology, pathogenesis, clinical features, and diagnostic modalities of these agents	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Paediatrics	Pathology
MI3.2	Identify the common etiologic agents of diarrhea and dysentery	S	SH	Y	DOAP session	Skill assessment		General Medicine, Paediatrics	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
MI3.3	Describe the enteric fever pathogens and discuss the evolution of the clinical course, the laboratory diagnosis of the diseases caused by them	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Pharmacology, Pathology
MI3.4	Identify the different modalities for diagnosis of enteric fever. Choose the appropriate test related to the duration of illness	S	KH	Y	DOAP session	Skill assessment		General Medicine	Pathology
MI3.5	Enumerate the causative agents of food poisoning and discuss the pathogenesis, clinical course and laboratory diagnosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Pharmacology
MI3.6	Describe the etio-pathogenesis of Acid peptic disease (APD) and the clinical course. Discuss the diagnosis and management of the causative agent of APD	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Pharmacology, Pathology
MI3.7	Describe the epidemiology, the etio- pathogenesis and discuss the viral markers in the evolution of Viral hepatitis. Discuss the modalities in the diagnosis, and prevention of viral hepatitis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Pathology
MI3.8	Choose the appropriate laboratory test in the diagnosis of viral hepatitis	K	KH	Y	Small group discussion, Case discussion	Written/ Viva voce/ OSPE		General Medicine	Pathology
MI4.1	Enumerate the microbial agents causing anaerobic infections. Describe the etiopathogenesis, clinical course and discuss the laboratory diagnosis of anaerobic infections	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	
MI5.1	Describe the etiopathogenesis, clinical course and discuss the laboratory diagnosis of meningitis	K	KH	Y	Lecture	Written/ Viva voce		General Medicine, Paediatrics	Pathology
MI5.2	Describe the etiopathogenesis, clinical course and discuss the laboratory diagnosis of encephalitis	K	KH	Y	Lecture	Written/ Viva voce		General Medicine, Paediatrics	Pathology
MI5.3	Identify the microbial agents causing meningitis	S	SH	Y	DOAP session	Skill assessment		General Medicine, Paediatrics	
MI6.1	Describe the etio-pathogenesis, laboratory diagnosis and prevention of Infections of upper and lower respiratory tract	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
MI6.2	Identify the common etiologic agents of upper respiratory tract infections (Gram Stain)	S	P	Y	DOAP session	Skill assessment	3	General Medicine	
MI6.3	Identify the common etiologic agents of lower respiratory tract infections (Gram Stain & Acid fast stain).	S	P	Y	DOAP session	Skill assessment	3	General Medicine	
MI7.3	Describe the etio-pathogenesis, clinical features, the appropriate method for specimen collection, and discuss the laboratory diagnosis of Urinary tract infections	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
MI8.1	Enumerate the microbial agents and their vectors causing Zoonotic diseases. Describe the morphology, mode of transmission, pathogenesis and discuss the clinical course, laboratory diagnosis and prevention	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
MI8.2	Describe the etio-pathogenesis of opportunistic infections (OI) and discuss the factors contributing to the occurrence of OI, and the laboratory diagnosis	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Pathology
MI8.3	Describe the role of oncogenic viruses in the evolution of virus associated malignancy	K	KH	Y	Lecture	Written		General Medicine	Pathology
MI8.4	Describe the etiologic agents of emerging Infectious diseases. Discuss the clinical course and diagnosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Community Medicine	
MI8.5	Define Healthcare Associated Infections (HAI) and enumerate it types. Discuss the factors that contribute to the development of HAI and the methods for prevention	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Community Medicine	
Pharmacology									
PH1.12	Calculate the dosage of drugs using appropriate formulae for an individual patient, including children, elderly and patient with renal dysfunction	K/S	SH	Y	Lecture, practical	Written/ Viva voce		Pediatrics, General Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
PH1.16	Describe mechanism/s of action, types, doses, side effects, indications and contraindications of the drugs which act by modulating autacoids, including: Anti-histaminics, 5-HT modulating drugs, NSAIDs, Drugs for gout, Anti-rheumatic drugs, drugs for migraine	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	
PH1.21	Describe the symptoms and management of methanol and ethanol poisonings	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		General Medicine	
PH1.25	Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of the drugs acting on blood, like anticoagulants, antiplatelets, fibrinolytics, plasma expanders	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, General Medicine	
PH1.26	Describe mechanisms of action, types, doses, side effects, indications and contraindications of the drugs modulating the renin angiotensin and aldosterone system	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, General Medicine	
PH1.27	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of Antihypertensive drugs and drugs used in shock	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PH1.28	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of the drugs used in ischemic heart disease (stable, unstable angina and myocardial infarction), peripheral vascular disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Pathology
PH1.29	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of the drugs used in congestive heart failure	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Pathology
PH1.30	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of the drugs used as Antiarrhythmics	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PH1.31	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of the drugs used in the management of dyslipidemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
PH1.34	Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of the drugs used as below: 1. Acid-peptic disease and GERD 2. Antiemetics and prokinetics 3. Antidiarrhoeals 4. Laxatives 5. Inflammatory Bowel Disease 6. Irritable Bowel Disorders, biliary and pancreatic diseases	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PH1.35	Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of drugs used in hematological disorders like: 1.Drugs used in anemias 2.Colony Stimulating factors	K	KH	Y	Lecture	Written/ Viva voce		General Medicine, Physiology	Pharmacology
PH1.36	Describe the mechanism of action, types, doses, side effects, indications and contraindications of drugs used in endocrine disorders (diabetes mellitus, thyroid disorders and osteoporosis)	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Pathology, Pharmacology
PH1.43	Describe and discuss the rational use of antimicrobials including antibiotic stewardship program	K	KH	Y	Lecture	Written/ Viva voce		General Medicine Pediatrics	Microbiology, Pharmacology
PH1.47	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of the drugs used in malaria, KALA-AZAR, amebiasis and intestinal helminthiasis	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Microbiology
PH1.52	Describe management of common poisoning, insecticides, common sting and bites	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	
PH2.4	Demonstrate the correct method of calculation of drug dosage in patients including those used in special situations	S	SH	Y	DOAP sessions	Skills assessment		Pediatrics, Pharmacology	
PH3.1	Write a rational, correct and legible generic prescription for a given condition and communicate the same to the patient	S/C	P	Y	Skill station	Skill station	5	General Medicine	
PH3.3	Perform a critical evaluation of the drug promotional literature	S	P	Y	Skill Lab	Maintenance of log book/ Skill station	3	General Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
PH3.5	To prepare and explain a list of P-drugs for a given case/condition	S	P	Y	Skill station	Maintenance of log book	3	General Medicine	
PH5.1	Communicate with the patient with empathy and ethics on all aspects of drug use	A/C	SH	Y	Small group discussion	Skill station		General Medicine	
PH5.4	Explain to the patient the relationship between cost of treatment and patient compliance	A/C	SH	Y	Small group discussion	Short note/ Viva voce		General Medicine	
Community Medicine									
CM3.1	Describe the health hazards of air, water, noise, radiation and pollution	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, ENT	
CM3.3	Describe the aetiology and basis of water borne diseases/jaundice/hepatitis/ diarrheal diseases	K	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce		Microbiology, General Medicine, Pediatrics	
CM5.1	Describe the common sources of various nutrients and special nutritional requirements according to age, sex, activity, physiological conditions	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Pediatrics	
CM5.2	Describe and demonstrate the correct method of performing a nutritional assessment of individuals, families and the community by using the appropriate method	S	SH	Y	DOAP sessions	Skill Assessment		General Medicine, Pediatrics	
CM5.3	Define and describe common nutrition related health disorders (including macro-PEM, Micro-iron, Zn, iodine, Vit. A), their control and management	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Pediatrics	
CM5.4	Plan and recommend a suitable diet for the individuals and families based on local availability of foods and economic status, etc in a simulated environment	S	SH	Y	DOAP sessions	Skill Assessment		General Medicine, Pediatrics	
CM5.5	Describe the methods of nutritional surveillance, principles of nutritional education and rehabilitation in the context of socio-cultural factors	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		General Medicine, Pediatrics	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
CM6.1	Formulate a research question for a study	K	KH	Y	Small group discussion, Lecture, DOAP sessions	Written/ Viva voce/ Skill Assessment		General Medicine, Pediatrics	
CM6.2	Describe and discuss the principles and demonstrate the methods of collection, classification, analysis, interpretation and presentation of statistical data	S	SH	Y	Small group discussion, Lecture, DOAP sessions	Written/ Viva voce/ Skill Assessment		General Medicine, Pediatrics	
CM6.3	Describe, discuss and demonstrate the application of elementary statistical methods including test of significance in various study designs	S	SH	Y	Small group discussion, Lecture, DOAP sessions	Written/ Viva voce/ Skill Assessment		General Medicine, Pediatrics	
CM6.4	Enumerate, discuss and demonstrate common sampling techniques, simple statistical methods, frequency distribution, measures of central tendency and dispersion	S	SH	Y	Small group discussion, Lecture, DOAP sessions	Written/ Viva voce/ Skill Assessment		General Medicine, Pediatrics	
CM7.1	Define Epidemiology and describe and enumerate the principles, concepts and uses	K	KH	Y	Small group discussion, Lecture	Written/ Viva voce		General Medicine	
CM7.2	Enumerate, describe and discuss the modes of transmission and measures for prevention and control of communicable and non-communicable diseases	K	KH	Y	Small group discussion, Lecture	Written/ Viva voce		General Medicine	
CM7.3	Enumerate, describe and discuss the sources of epidemiological data	K	KH	Y	Small group discussion, Lecture	Written/ Viva voce		General Medicine	
CM7.4	Define, calculate and interpret morbidity and mortality indicators based on given set of data	S	SH	Y	Small group discussion, DOAP sessions	Written/ Skill assessment		General Medicine	
CM7.5	Enumerate, define, describe and discuss epidemiological study designs.	K	KH	Y	Small group discussion, Lecture	Written / Viva voce		General Medicine	
CM7.6	Enumerate and evaluate the need of screening tests	S	SH	Y	Small group discussion, DOAP sessions	Written/ Skill assessment		General Medicine	
CM7.7	Describe and demonstrate the steps in the Investigation of an epidemic of communicable disease and describe the principles of control measures.	S	SH	Y	Small group discussion, DOAP sessions	Written/ Skill assessment		General Medicine	Microbiology

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
CM7.8	Describe the principles of association, causation and biases in epidemiological studies	K	KH	Y	Small group discussion, Lecture	Written/ Viva voce		General Medicine	
CM8.1	Describe and discuss the epidemiological and control measures including the use of essential laboratory tests at the primary care level for communicable diseases	K	KH	Y	Small group discussion, Lecture	Written/ Viva voce		General Medicine, Pediatrics	Microbiology Pathology
CM8.2	Describe and discuss the epidemiological and control measures including the use of essential laboratory tests at the primary care level for Non Communicable diseases (diabetes, Hypertension, Stroke, obesity and cancer etc.)	K	KH	Y	Small group discussion, Lecture	Written/ Viva voce		General Medicine	
CM8.3	Enumerate and describe disease-specific National Health Programs including their prevention and treatment of a case	K	KH	Y	Small group discussion, Lecture	Written/ Viva voce		General Medicine, Pediatrics	
CM8.4	Describe the principles and enumerate the measures to control a disease epidemic	K	KH	Y	Small group discussion, Lecture	Written/ Viva voce		General Medicine, Pediatrics	
CM8.5	Describe and discuss the principles of planning, implementing and evaluating control measures for disease at community level bearing in mind the public health importance of the disease	K	KH	Y	Small group discussion, Lecture	Written / Viva voce		General Medicine, Pediatrics	
CM12.1	Define and describe the concept of Geriatric services	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
CM12.2	Describe health problems of aged population	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
CM12.3	Describe the prevention of health problems of aged population	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
CM12.4	Describe National program for elderly	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
CM13.1	Define and describe the concept of Disaster management	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery, General Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
CM13.2	Describe disaster management cycle	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery, General Medicine	
CM13.3	Describe man made disasters in the world and in India	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		General Surgery, General Medicine	
CM13.4	Describe the details of the National Disaster management Authority	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		General Surgery, General Medicine	
Forensic Medicine & Toxicology									
FM1.9	Describe the importance of documentation in medical practice in regard to medicolegal examinations, Medical Certificates and medicolegal reports especially – maintenance of patient case records, discharge summary, prescribed registers to be maintained in Health Centres. -- maintenance of medico-legal register like accident register. - documents of issuance of wound certificate - documents of issuance of drunkenness certificate. - documents of issuance of sickness and fitness certificate. - documents for issuance of death certificate. - documents of Medical Certification of Cause of Death - Form Number4 and 4A - documents for estimation of age by physical, dental and radiological examination and issuance of certificate	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Radiodiagnosis, General Surgery, General Medicine, Pediatrics	
FM2.34	Demonstrate ability to use local resources whenever required like in mass disaster situations	A & C	KH	Y	Lecture, Small group discussion	Written/Viva voce		General Medicine, AETCOM	
FM3.22	Define and discuss impotence, sterility, frigidity, sexual dysfunction, premature ejaculation. Discuss the causes of impotence and sterility in male and female	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology, General Medicine	
FM5.5	Describe & discuss Delirium tremens	K	K/KH	Y	Lecture, Small group discussion	Written/Viva voce		Psychiatry, General Medicine	
FM8.6	Describe the general symptoms, principles of diagnosis and management of common poisons encountered in India.	K	K/KH	Y	Lecture, Small group discussion, Bed side clinic, DOAP session	Written/Viva voce/OSCE		Pharmacology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
FM8.7	Describe simple Bedside clinic tests to detect poison/drug in a patient's body fluids	K	K/KH	Y	Lecture, Small group discussion, Bed side clinic, DOAP session	Written/Viva voce/OSCE		Pharmacology, General Medicine	
FM8.8	Describe basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination	K	K/KH	Y	Lecture, Small group discussion, Bed side clinic, DOAP session	Written/ Viva voce/ OSCE		Pharmacology, General Medicine	
FM9.1	Describe General Principles and basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination with regard to: Caustics Inorganic – sulphuric, nitric, and hydrochloric acids Organic-Carboloic Acid (phenol), Oxalic and acetylsalicylic acids .	K	K/KH	Y	Lecture, Small group discussion, Bed side clinic, Autopsy, DOAP session	Written/ Viva voce/ OSCE		Pharmacology, General Medicine	
FM9.2	Describe General Principles and basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination with regard to Phosphorus, Iodine, Barium	K	K/KH	Y	Lecture, Small group discussion, Bed side clinic, Autopsy, DOAP session	Written/ Viva voce/ OSCE		Pharmacology, General Medicine	
FM9.3	Describe General Principles and basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination with regard to Arsenic, lead, mercury, copper, iron, cadmium and thallium	K	K/KH	Y	Lecture, Small group discussion, Bed side clinic, Autopsy, DOAP session	Written/ Viva voce/ OSCE		Pharmacology, General Medicine	
FM9.4	Describe General Principles and basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination with regard to Ethanol, methanol, ethylene glycol	K	K/KH	Y	Lecture, Small group discussion, Bed side clinic, Autopsy, DOAP session	Written/ Viva voce/ OSCE		Pharmacology, General Medicine	
FM9.5	Describe General Principles and basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination with regard to Organophosphates, Carbamates, Organochlorines, Pyrethroids, Paraquat, Aluminium and Zinc phosphide	K	K/KH	Y	Lecture, Small group discussion, Bed side clinic, Autopsy, DOAP session	Written/ Viva voce/ OSCE		Pharmacology, General Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
FM9.6	Describe General Principles and basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination with regard to Ammonia, carbon monoxide, hydrogen cyanide & derivatives, methyl isocyanate, tear (riot control) gases	K	K/KH	Y	Lecture, Small group discussion, Bed side clinic, Autopsy, DOAP session	Written/ Viva voce/ OSCE		Pharmacology, General Medicine	
FM10.1	Describe General Principles and basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination with regard to: i. Antipyretics – Paracetamol, Salicylates ii. Anti-Infectives (Common antibiotics – an overview) iii. Neuropsychotoxicology Barbiturates, benzodiazepines, phenytoin, lithium, haloperidol, neuroleptics, tricyclics iv. Narcotic Analgesics, Anaesthetics, and Muscle Relaxants v. Cardiovascular Toxicology Cardiotoxic plants – oleander, odollam, aconite, digitalis vi. Gastro-Intestinal and Endocrinal Drugs – Insulin	K	K/KH	Y	Lecture, Small group discussion, Bed side clinic, Autopsy, DOAP session	Written/ Viva voce/ OSCE		Pharmacology, General Medicine	
FM11.1	Describe features and management of Snake bite, scorpion sting, bee and wasp sting and spider bite	K	K/KH	Y	Lecture, Small group discussion, Autopsy	Written/Viva voce		General Medicine	
FM12.1	Describe features and management of abuse/poisoning with following camicals: Tobacco, cannabis, amphetamines, cocaine, hallucinogens, designer drugs& solvent	K	K/KH	Y	Lecture, Small group discussion, Autopsy	Written/Viva voce		General Medicine	
FM13.1	Describe toxic pollution of environment, its medico-legal aspects & toxic hazards of occupation and industry	K	K/KH	Y	Lecture, Small group discussion	Written/Viva voce		General Medicine	
FM14.2	Demonstrate the correct technique of clinical examination in a suspected case of poisoning & prepare medico-legal report in a simulated/ supervised environment	S	SH	Y	Bedside clinic (ward/casualty), Small group discussion	Logbook Skill station/Viva voce/ OSCE		General Medicine	
FM14.3	Assist and demonstrate the proper technique in collecting, preserving and dispatch of the exhibits in a suspected case of poisoning, along with clinical examination .	S	SH	Y	Bedside clinic, Small group discussion/DOAP session	Skill lab/Viva voce		General Medicine	
Dermatology, Venereology & Leprosy									

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
DR9.1	Classify, describe the epidemiology, etiology, microbiology pathogenesis and clinical presentations and diagnostic features of Leprosy	K	KH	Y	Lecture, Small group discussion	Written /Viva voce		General Medicine	Microbiology, Community Medicine
DR9.2	Demonstrate (and classify based on) the clinical features of leprosy including an appropriate neurologic examination	S	SH	Y	Lecture, Small group discussion	Bedside clinic session/ Skill assessment		General Medicine	
DR9.4	Enumerate, describe and identify lepra reactions and supportive measures and therapy of lepra reactions	K	KH	Y	Lecture, Small group discussion	Written /Viva voce		General Medicine	Pharmacology
DR9.5	Enumerate the indications and describe the pharmacology, administration and adverse reaction of pharmacotherapies for various classes of leprosy based on national guidelines	K	KH	Y	Lecture, Small group discussion	Written /Viva voce		General Medicine	Pharmacology, Community Medicine
DR9.6	Describe the treatment of Leprosy based on the WHO guidelines	K	KH	Y	Lecture, Small group discussion	Written /Viva voce		General Medicine	Pharmacology, Community Medicine
DR9.7	Enumerate and describe the complications of leprosy and its management, including understanding disability and stigma.	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		General Medicine	Pharmacology, Psychiatry
DR10.1	Identify and classify syphilis based on the presentation and clinical manifestations	S	SH	Y	Bedside clinic	Skill assessment		General Medicine	Microbiology
DR10.3	Enumerate the indications and describe the pharmacology, administration and adverse reaction of pharmacotherapies for syphilis	K	KH	Y	Lecture, Small group discussion	Written /Viva voce		General Medicine	Pharmacology, Microbiology
DR10.4	Describe the prevention of congenital syphilis	K	KH	Y	Lecture, Small group discussion	Written /Viva voce		General Medicine	
DR10.5	Counsel in a non-judgemental and empathetic manner patients on prevention of sexually transmitted diseases	C	SH	Y	Lecture, Small group discussion	Skill assessment		General Medicine	
DR10.6	Describe the etiology, diagnostic and clinical features of non-syphilitic sexually transmitted diseases (chancroid, donovanosis and LGV)	K	KH	Y	Lecture, Small group discussion	Written /Viva voce		General Medicine	Microbiology

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
DR10.7	Identify and differentiate based on the clinical features non-syphilitic sexually transmitted diseases (chancroid, donovanosis and LGV)	S	SH	Y	Lecture, Small group discussion	Skill assessment		General Medicine	Microbiology
DR10.8	Enumerate the indications and describe the pharmacology, indications and adverse reactions of drugs used in the non-syphilitic sexually transmitted diseases (chancroid, donovanosis and LGV)	K	KH	Y	Lecture, Small group discussion	Written /Viva voce		General Medicine	Pharmacology, Microbiology
DR10.9	Describe the syndromic approach to ulcerative sexually transmitted disease	K	KH	Y	Lecture, Small group discussion	Written /Viva voce		General Medicine	
DR10.10	Describe the etiology, diagnostic and clinical features and management of gonococcal and non gonococcal urethritis	K	KH	Y	Lecture, Small group discussion	Written /Viva voce		General Medicine	
DR11.1	Describe the etiology, pathogenesis and clinical features of the dermatologic manifestations of HIV and its complications including opportunistic infections	K	KH	Y	Lecture, Small group discussion	Written /Viva voce		General Medicine	Microbiology
DR11.2	Identify and distinguish the dermatologic manifestations of HIV its complications, opportunistic infections and adverse reactions	S	SH	Y	Lecture, Small group discussion	Skill assessment		General Medicine	Microbiology
DR11.3	Enumerate the indications and describe the pharmacology, administration and adverse reaction of pharmacotherapies for dermatologic lesions in HIV	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		General Medicine	Pharmacology, Microbiology
DR12.7	Identify and distinguish fixed drug eruptions and Steven Johnson syndrome from other skin lesions	S	SH	Y	Lecture, Small group discussion	Skill assessment		General Medicine	Pathology, Microbiology
DR16.1	Identify and distinguish skin lesions of SLE	S	SH	Y	Lecture, Small group discussion	Skill assessment		General Medicine	Pathology
DR16.2	Identify and distinguish Raynaud's phenomenon	S	SH	Y	Lecture, Small group discussion	Skill assessment		General Medicine	Pathology
DR17.1	Enumerate and identify the cutaneous findings in vitamin A deficiency	K/S	SH	Y	Lecture, Small group discussion	Skill assessment/ Viva voce		General Medicine, Pediatrics, Biochemistry	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
DR17.2	Enumerate and describe the various skin changes in Vitamin B complex deficiency	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		General Medicine, Pediatrics, Biochemistry	
DR17.3	Enumerate and describe the various changes in Vitamin C deficiency	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		General Medicine, Pediatrics, Biochemistry	
DR17.4	Enumerate and describe the various changes in Zinc deficiency	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		General Medicine, Pediatrics, Biochemistry	
DR18.1	Enumerate the cutaneous features of Type 2 diabetes	K	K	Y	Lecture, Small group discussion	Written/Viva voce		General Medicine	
DR18.2	Enumerate the cutaneous features of hypo- & hyperthyroidism	K	K	Y	Lecture, Small group discussion	Written/Viva voce		General Medicine	
Anesthesiology									
AS2.1	Enumerate the indications, describe the steps and demonstrate in a simulated environment basic life support in adults children and neonates	S	SH	N	DOAP session	Skill assessment		General Medicine, Pediatrics	
AS2.2	Enumerate the indications, describe the steps and demonstrate in a simulated environment advanced life support in adults and children	S	SH	N	DOAP session	Skill assessment		General Medicine	
AS3.1	Describe the principles of preoperative evaluation	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			General Surgery, General Medicine
AS3.2	Elicit, present and document an appropriate history including medication history in a patient undergoing Surgery as it pertains to a preoperative anaesthetic evaluation	S	SH	Y	DOAP session, Bedside clinic	Skill station			General Surgery, General Medicine
AS3.3	Demonstrate and document an appropriate clinical examination in a patient undergoing General Surgery	S	SH	Y	DOAP session, Bedside clinic	Skill station			General Surgery, General Medicine

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
AS3.4	Choose and interpret appropriate testing for patients undergoing Surgery	S	SH	Y	DOAP session, Bedside clinic	Skill station			General Surgery, General Medicine
AS3.5	Determine the readiness for General Surgery in a patient based on the preoperative evaluation	S	SH	Y	DOAP session, Bedside clinic	Skill station			General Surgery, General Medicine
AS7.2	Enumerate and describe the criteria for admission and discharge of a patient to an ICU	S	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce			General Medicine
AS7.3	Observe and describe the management of an unconscious patient	S	KH	Y	Lecture, Small group discussion DOAP session	Written/ Viva voce		Physiology	General Medicine
AS7.4	Observe and describe the basic setup process of a ventilator	S	KH	Y	Lecture, Small group discussion DOAP session	Written/ Viva voce		Physiology	General Medicine
AS7.5	Observe and describe the principles of monitoring in an ICU	S	KH	Y	Lecture, Small group discussion DOAP session	Written/ Viva voce			General Medicine
AS8.4	Describe the principles of pain management in palliative care	K	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce		Pharmacology	General Medicine
AS8.5	Describe the principles of pain management in the terminally ill	K	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce		Pharmacology	General Medicine
AS10.4	Define and describe common medical and medication errors in anaesthesia	K	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce		Pharmacology	General Medicine
Otorhinolaryngology (ENT)									
EN4.53	Describe the Clinical features, Investigations and principles of management of HIV manifestations of the ENT	K	KH	N	Lecture, Small group discussion, Demonstration	Written/ Viva voce/ Skill assessment		General Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
Ophthalmology									
OP5.2	Define, enumerate and describe the aetiology, associated systemic conditions, clinical features, complications, indications for referral and management of scleritis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
OP6.3	Enumerate systemic conditions that can present as iridocyclitis and describe their ocular manifestations	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
OP9.3	Describe the role of refractive error correction in a patient with headache and enumerate the indications for referral	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
Dentistry									
DE1.4	Discuss the role of dental caries as a focus of sepsis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology, General Medicine	
Psychiatry									
PS3.7	Enumerate and describe common organic psychiatric disorders, magnitude, etiology and clinical features	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			General Medicine
PS3.8	Enumerate and describe the essential investigations in patients with organic psychiatric disorders	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			General Medicine
PS4.1	Describe the magnitude and etiology of alcohol and substance use disorders	K	KH	Y	Lecture, Small group discussion	Lecture/ Small group discussion			General Medicine
PS4.2	Elicit, describe and document clinical features of alcohol and substance use disorders	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			General Medicine
PS4.3	Enumerate and describe the indications and interpret laboratory and other tests used in alcohol and substance abuse disorders	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			General Medicine
PS4.4	Describe the treatment of alcohol and substance abuse disorders including behavioural and pharmacologic therapy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	General Medicine

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
PS4.6	Enumerate and describe the pharmacologic basis and side effects of drugs used in alcohol and substance abuse	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	General Medicine
PS10.1	Enumerate and describe the magnitude and etiology of somatoform, dissociative and conversion disorders	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			General Medicine
PS10.2	Enumerate, elicit, describe and document clinical features in patients with somatoform, dissociative and conversion disorders	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			General Medicine
PS10.3	Enumerate and describe the indications and interpret laboratory and other tests used in somatoform, dissociative and conversion disorders	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			General Medicine
PS10.4	Describe the treatment of somatoform disorders including behavioural, psychosocial and pharmacologic therapy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	General Medicine
PS10.6	Enumerate and describe the pharmacologic basis and side effects of drugs used in somatoform, dissociative and conversion disorders	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	General Medicine
PS12.1	Enumerate and describe the magnitude and etiology of psychosomatic disorders	K	KH	Y	Lecture Small group discussion	Written/ Viva voce			General Medicine
PS12.2	Enumerate, elicit, describe and document clinical features in patients with magnitude and etiology of psychosomatic disorders	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			General Medicine
PS12.3	Enumerate and describe the indications and interpret laboratory and other tests of psychosomatic disorders	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			General Medicine
PS12.4	Describe the treatment of psychosomatic disorders including behavioural, psychosocial and pharmacologic therapy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	General Medicine
PS16.1	Enumerate and describe common psychiatric disorders in the elderly including dementia, depression and psychosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			General Medicine
PS16.2	Describe the aetiology and magnitude of psychiatric illness in the elderly	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			General Medicine
PS16.3	Describe the therapy of psychiatric illness in elderly including psychosocial and behavioural therapy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			General Medicine

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
PS16.4	Demonstrate family education in a patient with psychiatric disorders occurring in the elderly in a simulated environment	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			General Medicine
Obstetrics & Gynaecology									
OG12.1	Define, classify and describe the etiology and pathophysiology, early detection, investigations; principles of management of hypertensive disorders of pregnancy and eclampsia, complications of eclampsia	K	KH	Y	Lecture, Small group discussion, Bedside clinics	Written/ Viva voce/ Skill assessment			General Medicine
OG12.2	Define, Classify and describe the etiology, pathophysiology, diagnosis, investigations, adverse effects on the mother and foetus and the management during pregnancy and labor, and complications of anemia in pregnancy	K	KH	Y	Lecture, Small group discussion, Bedside clinics	Written/ Viva voce/ Skill assessment			General Medicine
OG12.3	Define, Classify and describe the etiology, pathophysiology, diagnosis, investigations, criteria, adverse effects on the mother and foetus and the management during pregnancy and labor, and complications of diabetes in pregnancy	K	KH	Y	Lecture,Small group discussion, Bedside clinics	Written/ Viva voce/ Skill assessment			General Medicine
OG12.4	Define, classify and describe the etiology, pathophysiology, diagnosis, investigations, criteria, adverse effects on the mother and foetus and the management during pregnancy and labor, and complications of heart diseases in pregnancy	K	KH	Y	Lecture, Small group discussion, Bedside clinics	Written/ Viva voce/ Skill assessment			General Medicine
OG12.5	Describe the clinical features, detection, effect of pregnancy on the disease and impact of the disease on pregnancy complications and management in pregnancy of urinary tract infections	K	KH	Y	Lecture, Small group discussion, Bedside clinics	Written/ Viva voce/ Skill assessment			General Medicine
OG12.6	Describe the clinical features, detection, effect of pregnancy on the disease and impact of the disease on pregnancy complications and management in pregnancy of liver disease	K	KH	Y	Lecture, Small group discussion, Bedside clinics	Written/ Viva voce/ Skill assessment			General Medicine
OG12.7	Describe and discuss Screening, risk factors, management of mother and newborn with HIV	K	KH	Y	Lecture, Small group discussion, Bedside clinics	Written/ Viva voce/ Skill assessment			General Medicine
Pediatrics									

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
PE14.3	Discuss the risk factors, clinical features, diagnosis and management of Organophosphorous poisoning	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	General Medicine
PE32.3	Interpret normal Karyotype and recognize Trisomy 21	S	SH	Y	Bedside clinics, Skills lab	Log book			General Medicine
PE32.9	Discuss the referral criteria and multidisciplinary approach to management of Turner Syndrome	K	KH	N	Lecture, Small group discussion	Written/ Viva voce			General Medicine, Obstetrics & Gynecology
General Surgery									
SU22.6	Describe and discuss the clinical features of hypo- & hyperparathyroidism and the principles of their management	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			General Medicine
SU23.2	Describe the etiology, clinical features and principles of management of disorders of adrenal gland	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			General Medicine
Orthopaedics									
OR5.1	Describe and discuss the aetiopathogenesis, clinical features, Investigations and principles of management of various inflammatory disorder of joints	K	K/KH	Y	Lecture, Small group Discussion, Bedside clinic	Written/ Viva voce OSCE			General Medicine
OR11.1	Describe and discuss the aetiopathogenesis, Clinical features, Investigations and principles of management of peripheral nerve injuries in diseases like foot drop, wrist drop, claw hand, palsies of Radial, Ulnar, Median, Lateral Popliteal and Sciatic Nerves	K	K/H	Y	Lecture Small Group discussion, case discussion	Written/ Viva voce OSCE		Human Anatomy	General Medicine, General surgery
Physical Medicine & Rehabiliation									
PM1.2	Define and describe disability, its cause, and magnitude, identification and prevention of disability	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			General Medicine Orthopedics
PM1.3	Define and describe the methods to identify and prevent disability	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			General Medicine Orthopedics

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
PM1.4	Enumerate the rights and entitlements of differently abled persons	K	K	Y	Lecture, Small group discussion	Written/ Viva voce			General Medicine Orthopedics
PM2.1	Describe the causes of disability in the patient with a cerebrovascular accident	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy	General Medicine
PM2.2	Describe and discuss the treatment of rigidity and spasticity	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			General Medicine
PM2.3	Describe and discuss the principles of early mobilizations, mobility aids and splints	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			General Medicine
PM2.4	Describe and discuss the impact of comorbidities on the rehabilitation of the patient with cerebrovascular accident	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			General Medicine
PM4.1	Describe the common patterns, clinical features, investigations, diagnosis and treatment of common causes of arthritis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			General Medicine Orthopedics
PM4.5	Demonstrate correct assessment of muscle strength and range of movements	S	SH	Y	DOAP session, Bedside clinic	Skill assessment			General Medicine Orthopedics
PM6.1	Perform and demonstrate a clinical examination of sensory and motor deficits of peripheral nerve	S	SH	Y	Bedside clinic	Skill assessment			General Medicine
PM6.2	Enumerate the indications and describe the principles of nerve conduction velocity and EMG	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			General Medicine
PM7.4	Assess bowel and bladder function and identify common patterns of bladder dysfunction	S	KH	Y	Small group discussion	Written/ Viva voce			General Medicine Orthopedics
PM7.6	Enumerate the indications and describe the pharmacology and side effects of commonly used drugs in neuropathic bladder	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	General Medicine
PM7.7	Enumerate and describe common life threatening complications following SCI like Deep vein Thrombosis, Aspiration Pneumonia, Autonomic dysreflexia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			General Medicine Orthopedics

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/ N	Suggested Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
PM8.1	Describe the clinical features, evaluation, diagnosis and management of disability following traumatic brain injury	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			General Medicine Orthopedics General Surgery
PM8.2	Describe and discuss cognitive dysfunction like deficits in attention, memory and communication	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			General Medicine
PM8.3	Describe and discuss common behavior and mood changes following TBI	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			General Medicine
PM8.4	Describe metabolic co-morbidities like SIADH, diabetes mellitus, insipidus and endocrine dysfunction following TBI	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			General Medicine
PM8.5	Describe the Vocational opportunities and community based rehabilitation following TBI	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			General Medicine
PM 9.1	Describe rehabilative aspects as they pertain to the elderly including patients with dementia, depression, incontinence immobility and nutritional needs	K	KH	Y	Lecture, Small group	Written Viva voce			General Medicine Psychiatry
Radiotherapy									
RT1.3	Enumerate, describe and discuss classification and staging of cancer (AJCC, FIGO etc.)	K	KH	Y	Lecture	Written/ Viva voce		Pathology	General Surgery General Medicine

RESPIRATORY MEDICINE (CODE: CT)

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
RESPIRATORY MEDICINE									
Topic:Tuberculosis		**Number of competencies: (19)**				**Number of procedures that require certification : (01)**			
CT1.1	Describe and discuss the epidemiology of tuberculosis and its impact on the work, life and economy of India	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine	
CT1.2	Describe and discuss the microbiology of tubercle bacillus, mode of transmission, pathogenesis, clinical evolution and natural history of pulmonary and extra pulmonary forms (including lymph node, bone and CNS)	K	KH	Y	Lecture, Small group discussion	written		Microbiology	
CT1.3	Discuss and describe the impact of co-infection with HIV and other co-morbid conditions. Like diabetes on the natural history of tuberculosis	K	K	Y	Lecture, Small group discussion	written		Microbiology	
CT1.4	Describe the epidemiology, the predisposing factors and microbial and therapeutic factors that determine resistance to drugs	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine, Microbiology, Pharmacology	
CT1.5	Elicit, document and present an appropriate medical history that includes risk factor, contacts, symptoms including cough and fever CNS and other manifestations	S	SH	Y	Bed side clinic, DOAP session	Skill assessment			
CT1.6	Demonstrate and perform a systematic examination that establishes the diagnosis based on the clinical presentation that includes a a) general examination, b) examination of the chest and lung including loss of volume, mediastinal shift, percussion and auscultation (including DOAP session of lung sounds and added sounds) c) examination of the lymphatic system and d) relevant CNS examination	S	SH	Y	Bed side clinic, DOAP session	Skill assessment			
CT1.7	Perform and interpret a PPD (mantoux) and describe and discuss the indications and pitfalls of the test	S	P	Y	DOAP session	Maintenance of log book		Microbiology	
CT1.8	Generate a differential diagnosis based on the clinical history and evolution of the disease that prioritises the most likely diagnosis	K	K	Y	Bedside clinic, Small group discussion	Bedside clinic/ Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
CT1.9	Order and interpret diagnostic tests based on the clinical presentation including: CBC, Chest X ray PA view, Mantoux, sputum culture and sensitivity, pleural fluid examination and culture, HIV testing	K	K	Y	Bedside clinic, DOAP session	Skill assessment			
CT1.10	Perform and interpret an AFB stain	S	P	Y	DOAP session	Skill assessment	1	Microbiology	
CT1.11	Assist in the performance, outline the correct tests that require to be performed and interpret the results of a pleural fluid aspiration	S	SH	Y	Skill assessment	Skill assessment			
CT1.12	Enumerate the indications for tests including: serology, special cultures and polymerase chain reaction and sensitivity testing	K	KH	Y	Small group discussion, Lecture	Short note/ Viva voce		Microbiology	
CT1.13	Describe and discuss the origin, indications, technique of administration, efficacy and complications of the BCG vaccine	K	KH	Y	Lecture, Small group discussion	Short note/ Viva voce		Microbiology	
CT1.14	Describe and discuss the pharmacology of various anti-tuberculous agents, their indications, contraindications, interactions and adverse reactions	K	KH	Y	Lecture, Small group discussion	Short note/ Viva voce		Pharmacology, Microbiology	
CT1.15	Prescribe an appropriate antituberculosis regimen based on the location of disease, smear positivity and negativity and co-morbidities based on current national guidelines including directly observed tuberculosis therapy (DOTS)	K	SH	Y	Bedside clinic, Small group discussion, Lecture	Skill assessment		Pharmacology, Community Medicine	
CT1.16	Describe the appropriate precautions, screening, testing and indications for chemoprophylaxis for contacts and exposed health care workers	K	KH	Y	Bedside clinic, Small group discussion	Written		Community Medicine	
CT1.17	Define criteria for the cure of Tuberculosis; describe and recognise the features of drug resistant tuberculosis, prevention and therapeutic regimens	S	P	Y	Lecture, Small group discussion	Written			
CT1.18	Educate health care workers on National Program of Tuberculosis and administering and monitoring the DOTS program	C	SH	Y	DOAP session	Skill assessment		Community Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
CT1.19	Communicate with patients and family in an empathetic manner about the diagnosis, therapy	S	P	Y	DOAP session	Skill assessment		AETCOM	
Topic: Obstructive airway disease		**Number of competencies: (28)**				**Number of procedures that require certification : (01)**			
CT2.1	Define and classify obstructive airway disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Pathology	
CT2.2	Describe and discuss the epidemiology, risk factors and evolution of obstructive airway disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology , Pathology	
CT2.3	Enumerate and describe the causes of acute episodes in patients with obstructive airway disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
CT2.4	Describe and discuss the physiology and pathophysiology of hypoxia and hypercapneia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Pathology	
CT2.5	Describe and discuss the genetics of alpha 1 antitrypsin deficiency in emphysema	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Physiology, Pathology	
CT2.6	Describe the role of the environment in the cause and exacerbation of obstructive airway disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
CT2.7	Describe and discuss allergic and non-allergic precipitants of obstructive airway disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
CT2.8	Elicit document and present a medical history that will differentiate the aetiologies of obstructive airway disease, severity and precipitants	S	SH	Y	Bed side clinic, DOAP session	Skill assessment			
CT2.9	Perform a systematic examination that establishes the diagnosis and severity that includes measurement of respiratory rate, level of respiratory distress, effort tolerance, breath sounds, added sounds, identification of signs of consolidation pleural effusion and pneumothorax	S	SH	Y	Bed side clinic, DOAP session	Skill assessment			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
CT2.10	Generate a differential diagnosis and prioritise based on clinical features that suggest a specific aetiology	S	SH	Y	Bed side clinic, DOAP session	Skill assessment/ Written			
CT2.11	Describe, discuss and interpret pulmonary function tests	S	SH	Y	Bed side clinic, DOAP session	Skill assessment		Physiology, Pathology	
CT2.12	Perform and interpret peak expiratory flow rate	S	P	Y	Bedside clinic, DOAP session	documentation in log book/ Skill assessment	3		
CT2.13	Describe the appropriate diagnostic work up based on the presumed aetiology	S	SH	Y	Bedside clinic, Small group discussion	Written/ Skill assessment			
CT2.14	Enumerate the indications for and interpret the results of : pulse oximetry, ABG, Chest Radiograph	K	SH	Y	Bedside clinics, Small group discussion, DOAP session	Written/ Skill assessment			
CT2.15	Generate a differential diagnosis and prioritise based on clinical features that suggest a specific aetiology	K	SH	Y	Bedside clinics, Small group discussion, DOAP session	Written/ Skill assessment			
CT2.16	Discuss and describe therapies for OAD including bronchodilators, leukotriene inhibitors, mast cell stabilisers, theophylline, inhaled and systemic steroids, oxygen and immunotherapy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
CT2.17	Describe and discuss the indications for vaccinations in OAD	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
CT2.18	Develop a therapeutic plan including use of bronchodilators and inhaled corticosteroids	K	SH	Y	Bedside clinics, Small group discussion, DOAP session	Written/ Skill assessment			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
CT2.19	Develop a management plan for acute exacerbations including bronchodilators, systemic steroids, antimicrobial therapy	K	SH	Y	Bedside clinics, Small group discussion, DOAP session	Written/ Skill assessment			
CT2.20	Describe and discuss the principles and use of oxygen therapy in the hospital and at home	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
CT2.21	Describe discuss and counsel patients appropriately on smoking cessation	K/C	SH	Y	DOAP session	Skill assessment		AETCOM	
CT2.22	Demonstrate and counsel patient on the correct use of inhalers	S/C	SH	Y	DOAP session	Skill assessment			
CT2.23	Communicate diagnosis treatment plan and subsequent follow up plan to patients	K/C	SH	Y	DOAP session	Skill assessment			
CT2.24	Recognise the impact of OAD on patient's quality of life, well being, work and family	A	KH	Y	Small group discussion, Bedside clinics	Observation by faculty		Community Medicine	
CT2.25	Discuss and describe the impact of OAD on the society and workplace	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine	
CT2.26	Discuss and describe preventive measures to reduce OAD in workplaces	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine	
CT2.27	Demonstrate an understanding of patient's inability to change working, living and environmental factors that influence progression of airway disease	A	KH	Y	Small group discussion, Bedside clinics	Observation by faculty		Community Medicine	
CT2.28	Demonstrate an understanding for the difficulties faced by patients during smoking cessation	A	KH	Y	Small group discussion, Bedside clinics	Observation by faculty			
	Column C: K- Knowledge, S – Skill, A - Attitude / professionalism, C- Communication. **Column D: K – Knows, KH - Knows How, SH - Shows how, P- performs independently,** **Column F: DOAP session – Demonstrate, Observe, Assess, Perform.** **Column H: If entry is P: indicate how many procedures must be done independently for certification/ graduation**								

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
Integration									
				Physiology					
PY6.8	Demonstrate the correct techinque to perform & interpret Spirometry	S	SH	Y	DOAP sessions	Skill assessment/ Viva voce		Respiratory Medicine	
				Pharmacology					
PH1.32	Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of drugs used in bronchial asthma and COPD	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Respiratory Medicine	
PH1.33	Describe the mechanism of action, types, doses, side effects, indications and contraindications of the drugs used in cough (antitussives, expectorants/ mucolytics)	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Respiratory Medicine	
PH1.44	Describe the first line antitubercular dugs, their mechanisms of action, side effects and doses.	K	KH	Y	Lecture	Written/ Viva voce		Respiratory Medicine	
PH1.45	Describe the dugs used in MDR and XDR Tuberculosis	K	KH	Y	Lecture	Written/ Viva voce		Respiratory Medicine	Microbiology
				General Medicine					
IM24.10	Describe and discuss the aetiopathogenesis,clinical presentation, identification, functional changes, acute care, stabilization, management and rehabilitation of COPD in the elderly	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Respiratory Medicine
				Pediatrics					
PE28.19	Describe the etio-pathogenesis, clinical features, diagnosis, management and prevention of asthma in children	S	SH	Y	Bedside clinics, Small group discussion, Lecture	Skill Assessment/ Written/ Viva voce		Respiratory Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PE28.20	Counsel the child with asthma on the correct use of inhalers in a simulated environment	S	P	Y	Bedside clinics, Small group discussion, Lecture	Skills Assessment/ Written/ Viva voce	3	Respiratory Medicine	
PE34.1	Discuss the epidemiology, clinical features, clinical types, complications of Tuberculosis in Children and Adolescents	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology	Respiratory Medicine
PE34.2	Discuss the various diagnostic tools for childhood tuberculosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology	Respiratory Medicine
PE34.3	Discuss the various regimens for management of Tuberculosis as per National Guidelines	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology, Community Medicine, Pharmacology	Respiratory Medicine
PE34.4	Discuss the preventive strategies adopted and the objectives and outcome of the National Tuberculosis Control Program	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology, Community Medicine, Pharmacology	Respiratory Medicine
PE34.5	Able to elicit, document and present history of contact with tuberculosis in every patient encounter	S	SH	Y	Bedside clinics, Skill lab	Skill Assessment			Respiratory Medicine
PE34.6	Identify a BCG scar	S	P	Y	Bed side clinics, Skills lab	Skill Assessment	3	Microbiology	Respiratory Medicine
PE34.7	Interpret a Mantoux test	S	P	Y	Bed side clinics Skills lab	Skill assessment	3	Microbiology	Respiratory Medicine
PE34.8	Interpret a Chest Radiograph	S	SH	Y	Bedside clinics Skills lab	Skill assessment		Radiodiagnosis	Respiratory Medicine
PE34.9	Interpret blood tests in the context of laboratory evidence for tuberculosis	S	SH	N	Bed side clinics, Small group discussion	Log book		Microbiolgoy	Respiratory Medicine
PE34.10	Discuss the various samples for demonstraing the organism eg Gastric Aspirate, Sputum , CSF, FNAC	K	KH	Y	Bed side clinics, Small group discussion	Written/ Viva voce		Microbiolgoy	Respiratory Medicine
PE34.11	Perform AFB staining	S	P	Y	DOAP session	Log book/Journal	3	Microbiology	Respiratory Medicine
PE34.12	Enumerate the indications and discuss the limitations of methods of culturing M.Tuberculii	K	KH	Y	Small group discussion	Written/ Viva voce		Microbiology	Respiratory Medicine

PEDIATRICS (CODE: PE)

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
PEDIATRICS									
Topic: Normal Growth and Development		**Number of competencies : (07)**				**Number of procedures that require certification: (02)**			
PE1.1	Define the terminologies Growth and development and discuss the factors affecting normal growth and development	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PE1.2	Discuss and describe the patterns of growth in infants, children and adolescents	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Psychiatry
PE1.3	Discuss and describe the methods of assessment of growth including use of WHO and Indian national standards. Enumerate the parameters used for assessment of physical growth in infants, children and adolescents	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Psychiatry
PE1.4	Perform Anthropometric measurements, document in growth charts and interpret	S	P	Y	Small group discussion	Document in Log book	3		
PE1.5	Define development and discuss the normal developmental mile stones with respect to motor, behaviour, social, adaptive and language	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Psychiatry
PE1.6	Discuss the methods of assessment of development	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PE1.7	Perform Developmental assessment and interpret	S	P	N	Bedside clinics, Skills Lab	Document in Log book	3		
Topic: Common problems related to Growth		**Number of competencies:(06)**				**Number of procedures that require certification: (NIL)**			
PE2.1	Discuss the etio-pathogenesis, clinical features and management of a child who fails to thrive	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PE2.2	Assessment of a child with failing to thrive including eliciting an appropriate history and examination	S	SH	Y	Bedside clinics	Skills Station			

Number	**COMPETENCY** **The student should be able to**	**Domain K/S/A/C**	**Level K/KH/ SH/P**	**Core Y/N**	**Suggested Teaching Learning methods**	**Suggested Assessment methods**	**Number required to certify P**	**Vertical Integration**	**Horizontal Integration**
PE2.3	Counselling a parent with failing to thrive child	A/C	SH	Y	OSPE	Document in Log book		AETCOM	
PE2.4	Discuss the etio-pathogenesis, clinical features and management of a child with short stature	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PE2.5	Assessment of a child with short stature: Elicit history, perform examination, document and present	S	SH	Y	Bedside clinics, Skill lab	Skill Assessment			
PE2.6	Enumerate the referral criteria for growth related problems	K	K	Y	Small group discussion	Written/ Viva voce			
Topic: Common problems related to Development -1 (Developmental delay , Cerebral palsy) **Number of competencies:(08) Number of procedures that require certification: (NIL)**									
PE3.1	Define, enumerate and discuss the causes of developmental delay and disability including intellectual disability in children	K	K	Y	Lecture, Small group discussion	Written/ Viva voce			
PE3.2	Discuss the approach to a child with developmental delay	K	K	Y	Lecture, Small group discussion	Written/ Viva voce			
PE3.3	Assessment of a child with developmental delay - Elicit document and present history	S	SH	Y	Bedside clinics, Skills lab	Skill Assessment			
PE3.4	Counsel a parent of a child with developmental delay	S	SH	Y	DOAP session	Document in Log Book			
PE3.5	Discuss the role of the child developmental unit in management of developmental delay	K	K	N	Lecture, Small group discussion	Written/ Viva voce		Community Medicine	
PE3.6	Discuss the referral criteria for children with developmental delay	K	K	Y	Lecture, Small group discussion	Written/ Viva voce			
PE3.7	Visit a Child Developmental Unit and observe its functioning	S	KH	Y	Lecture, Small group discussion	Log book Entry		Community Medicine	
PE3.8	Discuss the etio-pathogenesis, clinical presentation and multi-disciplinary approach in the management of Cerebral palsy	K	KH	Y	Lecture, Small group, Bedside clinics	Written/ Viva voce			Physical Medicine & Rehabilitation

Number	**COMPETENCY** **The student should be able to**	**Domain K/S/A/C**	**Level K/KH/ SH/P**	**Core Y/N**	**Suggested Teaching Learning methods**	**Suggested Assessment methods**	**Number required to certify P**	**Vertical Integration**	**Horizontal Integration**
Topic: Common problems related to Development-2 (Scholastic backwardness, Learning Disabilities , Autism , ADHD) **Number of competencies: (06)** **Number of procedures that require certification: (NIL)**									
PE4.1	Discuss the causes and approach to a child with scholastic backwardness	K	K	N	Lecture, Small group discussion	Written			
PE4.2	Discuss the etiology, clinical features, diagnosis and management of a child with Learning Disabilities	K	K	N	Lecture, Small group discussion	Written			
PE4.3	Discuss the etiology, clinical features, diagnosis and management of a child with Attention Deficit Hyperactivity Disorder (ADHD)	K	K	N	Lecture, Small group discussion	Written			
PE4.4	Discuss the etiology, clinical features, diagnosis and management of a child with Autism	K	K	N	Lecture, Small group discussion	Written			
PE4.5	Discuss the role of Child Guidance clinic in children with Developmental problems	K	K	N	Lecture, Small group discussion	Written/ Viva voce		Psychiatry	
PE4.6	Visit to the Child Guidance Clinic	S	KH	N	Lecture, Small group discussion	Document in Log Book			
Topic: Common problems related to behavior **Number of competencies: (11)** **Number of procedures that require certification: (NIL)**									
PE5.1	Describe the clinical features, diagnosis and management of thumb sucking	K	K	N	Lecture, Small group discussion	Written			
PE5.2	Describe the clinical features, diagnosis and management of Feeding problems	K	K	N	Lecture, Small group discussion	Written			
PE5.3	Describe the clinical features, diagnosis and management of nail biting	K	K	N	Lecture, Small group discussion	Written/ Viva voce			
PE5.4	Describe the clinical features, diagnosis and management of Breath Holding spells	K	K	N	Lecture, Small group discussion	Written/ Viva voce			Psychiatry

Number	**COMPETENCY** **The student should be able to**	**Domain K/S/A/C**	**Level K/KH/ SH/P**	**Core Y/N**	**Suggested Teaching Learning methods**	**Suggested Assessment methods**	**Number required to certify P**	**Vertical Integration**	**Horizontal Integration**
PE5.5	Describe the clinical features, diagnosis and management of temper tantrums	K	K	N	Lecture, Small group discussion	Written/ Viva voce			Psychiatry
PE5.6	Describe the clinical features, diagnosis and management of Pica	K	K	N	Lecture, Small group discussion	Written/ Viva voce			
PE5.7	Describe the clinical features, diagnosis and management of Fussy infant	K	K	N	Lecture, Small group discussion	Written			Psychiatry
PE5.8	Discuss the etiology, clinical features and management of Enuresis	K	K	N	Lecture, Small group discussion	Written/ Viva voce			
PE5.9	Discuss the etiology, clinical features and management of Encopresis	K	K	N	Lecture, Small group discussion	Written/ Viva voce			
PE5.10	Discuss the role of child guidance clinic in children with behavioural problems and the referral criteria	K	K	N	Lecture, Small group discussion	Written/ Viva voce			Psychiatry
PE5.11	Visit to Child Guidance Clinic and observe functioning	K	KH	N	Lecture, Small group discussion	Document in Log Book			
Topic: Adolescent Health & common problems related to Adolescent Health Number of competencies: (13) Number of procedures that require certification: (NIL)									
PE6.1	Define Adolescence and stages of adolescence	K	K	Y	Lecture, Small group discussion	Written/ Viva voce			
PE6.2	Describe the physical, physiological and psychological changes during adolescence (Puberty)	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Psychiatry
PE6.3	Discuss the general health problems during adolescence	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PE6.4	Describe adolescent sexuality and common problems related to it	K	KH	N	Lecture, Small group discussion	Written/ Viva voce			Psychiatry
PE6.5	Explain the Adolescent Nutrition and common nutritional problems	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Psychiatry

Number	**COMPETENCY** **The student should be able to**	**Domain K/S/A/C**	**Level K/KH/ SH/P**	**Core Y/N**	**Suggested Teaching Learning methods**	**Suggested Assessment methods**	**Number required to certify P**	**Vertical Integration**	**Horizontal Integration**
PE6.6	Discuss the common Adolescent eating disorders (Anorexia Nervosa, Bulimia)	K	KH	N	Lecture, Small group discussion	Written/ Viva voce			Psychiatry
PE6.7	Describe the common mental health problems during adolescence	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Psychiatry
PE6.8	Respecting patient privacy and maintaining confidentiality while dealing with adolescence	A	SH	Y	Bedside clinics	Document in log book			AETCOM
PE6.9	Perform routine Adolescent Health check up including eliciting history, performing examination including SMR (Sexual Maturity Rating), growth assessments (using Growth charts) and systemic exam including thyroid and Breast exam and the HEADSS screening	S	SH	Y	Bedside clinics	Skills station			
PE6.10	Discuss the objectives and functions of AFHS (Adolescent Friendly Health Services) and the referral criteria	K	K	N	Lecture, Small group discussion	Written/ Viva voce			
PE6.11	Visit to the Adolescent Clinic	S	KH	Y	DOAP session	Document in Log Book			
PE6.12	Enumerate the importance of obesity and other NCD in adolescents	K	K	Y	Lecture, Small group discussion	Written/ Viva voce			
PE6.13	Enumerate the prevalence and the importance of recognition of sexual drug abuse in adolescents and children	K	K	N	Lecture, Small group discussion	Written/ Viva voce			Psychiatry
Topic: To promote and support optimal Breast feeding for Infants **Number of competencies: (11)** **Number of procedures that require certification: (01)**									
PE7.1	Awareness on the cultural beliefs and practices of breast feeding	K	K	N	Lecture, Small group discussion	Viva			Obstetrics & Gynaecology
PE7.2	Explain the physiology of lactation	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology	

Number	**COMPETENCY** **The student should be able to**	**Domain K/S/A/C**	**Level K/KH/ SH/P**	**Core Y/N**	**Suggested Teaching Learning methods**	**Suggested Assessment methods**	**Number required to certify P**	**Vertical Integration**	**Horizontal Integration**
PE7.3	Describe the composition and types of breast milk and discuss the differences between cow's milk and Human milk	K	KH	Y	Lecture, debate	Written/ Viva voce		Physiology	
PE7.4	Discuss the advantages of breast milk	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PE7.5	Observe the correct technique of breast feeding and distinguish right from wrong techniques	S	P	Y	Bedside clinics, Skills lab	Skill Assessment	3		
PE7.6	Enumerate the baby friendly hospital initiatives	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PE7.7	Perform breast examination and identify common problems during lactation such as retracted nipples, cracked nipples, breast engorgement, breast abscess	S	SH	Y	Bedside clinics, Skill Lab	Skill Assessment			Obstetrics & Gynaecology, AETCOM
PE7.8	Educate mothers on ante natal breast care and prepare mothers for lactation	A/C	SH	Y	DOAP session	Document in Log Book			AETCOM
PE7.9	Educate and counsel mothers for best practices in Breast feeding	A/C	SH	Y	DOAP session	Document in Log Book			Obstetrics & Gynaecology, AETCOM
PE7.10	Respects patient privacy	A	SH	Y	DOAP session	Document in Log Book			AETCOM
PE7.11	Participate in Breast Feeding Week Celebration	A	SH	Y	DOAP session	Document in Log Book			
Topic: Complementary Feeding		**Number of competencies : (05)**				**Number of procedures that require certification: (NIL)**			
PE8.1	Define the term Complementary Feeding	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine	

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PE8.2	Discuss the principles, the initiation, attributes, frequency, techniques and hygiene related to Complementary Feeding including IYCF	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine	
PE8.3	Enumerate the common complimentary foods	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine	
PE8.4	Elicit history on the Complementary Feeding habits	S	SH	Y	Bedside clinics, Skills lab	Skill Assessment		Community Medicine	
PE8.5	Counsel and educate mothers on the best practices in Complimentary Feeding	A/C	SH	Y	DOAP session	Document in Log Book		Community Medicine	
Topic: Normal nutrition, assessment and monitoring **Numbcompetencies : (07)** **Number of procedures that require certification: (NIL)**									
PE9.1	Describe the age related nutritional needs of infants, children and adolescents including micronutrients and vitamins	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine, Biochemistry	
PE9.2	Describe the tools and methods for assessment and classification of nutritional status of infants, children and adolescents	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine	
PE9.3	Explains the Calorific value of common Indian foods	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE9.4	Elicit document and present an appropriate nutritional history and perform a dietary recall	S	SH	Y	Bedside clinic, Skills lab	Skill Assessment		Community Medicine	
PE9.5	Calculate the age related calorie requirement in Health and Disease and identify gap	S	SH	Y	Bedside clinics, Small group discussion	Skill assessment		Community Medicine	
PE9.6	Assess and classify the nutrition status of infants, children and adolescents and recognize deviations	S	SH	Y	Bedside clinic, Small group discussion	Skill Assessment		Community Medicine	

Number	**COMPETENCY** **The student should be able to**	**Domain K/S/A/C**	**Level K/KH/ SH/P**	**Core Y/N**	**Suggested Teaching Learning methods**	**Suggested Assessment methods**	**Number required to certify P**	**Vertical Integration**	**Horizontal Integration**
PE9.7	Plan an appropriate diet in health and disease	S	SH	N	Bedside clinic, Small group discussion	Document in logbook		Community Medicine	
Topic: Provide nutritional support , assessment and monitoring for common nutritional problems **Number of competencies: (06)** **Number of procedures that require certification: (NIL)**									
PE10.1	Define and describe the etio-pathogenesis, classify including WHO classification, clinical features, complication and management of Severe Acute Malnourishment (SAM) and Moderate Acute Malnutrition (MAM)	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry	
PE10.2	Outline the clinical approach to a child with SAM and MAM	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry	
PE10.3	Assessment of a patient with SAM and MAM, diagnosis, classification and planning management including hospital and community based intervention, rehabilitation and prevention	S	SH	Y	Bedside clinics, Skills lab	Skill station		Physiology, Biochemistry	
PE10.4	Identify children with under nutrition as per IMNCI criteria and plan referral	S	SH	Y	DOAP session	Document in log book		Community Medicine	
PE10.5	Counsel parents of children with SAM and MAM	S	SH	Y	Bedside clinic, Skills Station	Document in Log book		AETCOM	
PE10.6	Enumerate the role of locally prepared therapeutic diets and ready to use therapeutic diets	K	K	N	Lecture, Small group discussion	Written/ Viva voce			
Topic: Obesity in children **Number of competencies: (06)** **Number of procedures that require certification: (01)**									
PE11.1	Describe the common etiology, clinical features and management of obesity in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry, Pathology	

Number	**COMPETENCY** **The student should be able to**	**Domain K/S/A/C**	**Level K/KH/ SH/P**	**Core Y/N**	**Suggested Teaching Learning methods**	**Suggested Assessment methods**	**Number required to certify P**	**Vertical Integration**	**Horizontal Integration**
PE11.2	Discuss the risk approach for obesity and discuss the prevention strategies	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Pathology	
PE11.3	Assessment of a child with obesity with regard to eliciting history including physical activity, charting and dietary recall	S	SH	Y	Bedside clinics, Standardized patients	Document in log book			
PE11.4	Examination including calculation of BMI, measurement of waist hip ratio, identifying external markers like acanthosis, striae, pseudogynaecomastia etc	S	SH	Y	Bedside clinics, Standardized patients, Videos	Skills Station			
PE11.5	Calculate BMI, document in BMI chart and interpret	S	P	Y	Bedside clinics, Small group discussion	Document in log book	3		
PE11.6	Discuss criteria for referral	K	K	Y	Small group discussion	Viva voce			
Topic: Micronutrients in Health and disease-1 (Vitamins ADEK, B Complex and C) **Number of competencies: (21)** **Number of procedures that require certification: (NIL)**									
PE12.1	Discuss the RDA, dietary sources of Vitamin A and their role in Health and disease	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE12.2	Describe the causes, clinical features, diagnosis and management of Deficiency / excess of Vitamin A	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE12.3	Identify the clinical features of dietary deficiency / excess of Vitamin A	S	SH	Y	Bedside clinics, Small group discussion	Document in log book		Biochemistry	
PE12.4	Diagnose patients with Vitamin A deficiency, classify and plan management	S	SH	N	Bedside clinics, Skill Station	Document in log book		Biochemistry	
PE12.5	Discuss the Vitamin A prophylaxis program and their recommendations	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	

Number	**COMPETENCY** **The student should be able to**	**Domain K/S/A/C**	**Level K/KH/ SH/P**	**Core Y/N**	**Suggested Teaching Learning methods**	**Suggested Assessment methods**	**Number required to certify P**	**Vertical Integration**	**Horizontal Integration**
PE12.6	Discuss the RDA, dietary sources of Vitamin D and their role in health and disease	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE12.7	Describe the causes, clinical features, diagnosis and management of Deficiency / excess of Vitamin D (Rickets and Hypervitaminosis D)	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, Physiology, Pathology	
PE12.8	Identify the clinical features of dietary deficiency of Vitamin D	S	SH	Y	Bedside clinics, Skills lab	Document in log book		Biochemistry, Physiology, Pathology	
PE12.9	Assess patients with Vitamin D deficiency, diagnose, classify and plan management	S	SH	Y	Bedside clinics	Document in log book		Biochemistry, Physiology, Pathology	
PE12.10	Discuss the role of screening for Vitamin D deficiency	K	K	Y	Lecture, Small group discussion	Written/ Viva voce			
PE12.11	Discuss the RDA, dietary sources of Vitamin E and their role in health and disease	K	K	N	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE12.12	Describe the causes, clinical features, diagnosis and management of deficiency of Vitamin E	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE12.13	Discuss the RDA, dietary sources of Vitamin K and their role in health and disease	K	K	N	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, Physiology, Pathology	
PE12.14	Describe the causes, clinical features, diagnosis management and prevention of deficiency of Vitamin K	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, Physiology, Pathology	
PE12.15	Discuss the RDA, dietary sources of Vitamin B and their role in health and disease	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE12.16	Describe the causes, clinical features, diagnosis and management of deficiency of B complex Vitamins	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	

Number	**COMPETENCY** **The student should be able to**	**Domain K/S/A/C**	**Level K/KH/ SH/P**	**Core Y/N**	**Suggested Teaching Learning methods**	**Suggested Assessment methods**	**Number required to certify P**	**Vertical Integration**	**Horizontal Integration**
PE12.17	Identify the clinical features of Vitamin B complex deficiency	S	SH	Y	Bedside clinics, Skills lab	Document in log book		Biochemistry	
PE12.18	Diagnose patients with Vitamin B complex deficiency and plan management	S	SH	Y	Bedside clinics, Skills lab	Document in log book		Biochemistry	
PE12.19	Discuss the RDA , dietary sources of Vitamin C and their role in Health and disease	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE12.20	Describe the causes, clinical features, diagnosis and management of deficiency of Vitamin C (scurvy)	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE12.21	Identify the clinical features of Vitamin C deficiency	S	SH	N	Bedside clinics, Skill lab	Document in log book		Biochemistry	
Topic: Micronutrients in Health and disease -2: Iron, Iodine, Calcium, Magnesium **Number of competencies: (14)** **Number of procedures that require certification: (NIL)**									
PE13.1	Discuss the RDA, dietary sources of Iron and their role in health and disease	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Biochemistry	
PE13.2	Describe the causes, diagnosis and management of Fe deficiency	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Biochemistry	
PE13.3	Identify the clinical features of dietary deficiency of Iron and make a diagnosis	S	SH	Y	Bedside clinics, Skills lab	Document in log book		Pathology, Biochemistry	
PE13.4	Interpret hemogram and Iron Panel	S	SH	Y	Bedside clinic, Small group discussion	Skill Assessment		Pathology, Biochemistry	
PE13.5	Propose a management plan for Fe deficiency anaemia	S	SH	Y	Bedside clinics, Skills lab	Skill Assessment		Pathology, Pharmacology	
PE13.6	Discuss the National anaemia control program and its recommendations	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology, Community Medicine	

Number	**COMPETENCY** **The student should be able to**	**Domain K/S/A/C**	**Level K/KH/ SH/P**	**Core Y/N**	**Suggested Teaching Learning methods**	**Suggested Assessment methods**	**Number required to certify P**	**Vertical Integration**	**Horizontal Integration**
PE13.7	Discuss the RDA , dietary sources of Iodine and their role in Health and disease	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE13.8	Describe the causes, diagnosis and management of deficiency of Iodine	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE13.9	Identify the clinical features of Iodine deficiency disorders	S	SH	N	Lecture, Bedside clinic	Written/ Viva voce		Biochemistry	
PE13.10	Discuss the National Goiter Control program and their recommendations	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, Community Medicine	
PE13.11	Discuss the RDA, dietary sources of Calcium and their role in health and disease	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE13.12	Describe the causes, clinical features, diagnosis and management of Ca Deficiency	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE13.13	Discuss the RDA, dietary sources of Magnesium and their role in health and disease	K	K	N	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE13.14	Describe the causes, clinical features, diagnosis and management of Magnesium Deficiency	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
Topic: Toxic elements and free radicals and oxygen toxicity **Number of competencies: (05)** **Number of procedures that require certification (NIL)**									
PE14.1	Discuss the risk factors, clinical features, diagnosis and management of Lead Poisoning	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
PE14.2	Discuss the risk factors, clinical features, diagnosis and management of Kerosene ingestion	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		ENT	
PE14.3	Discuss the risk factors, clinical features, diagnosis and management of Organophosphorous poisoning	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	General Medicine

Number	**COMPETENCY** **The student should be able to**	**Domain K/S/A/C**	**Level K/KH/ SH/P**	**Core Y/N**	**Suggested Teaching Learning methods**	**Suggested Assessment methods**	**Number required to certify P**	**Vertical Integration**	**Horizontal Integration**
PE14.4	Discuss the risk factors, clinical features, diagnosis and management of paracetamol poisoning	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
PE14.5	Discuss the risk factors, clinical features, diagnosis and management of Oxygen toxicity	K	KH	N	Lecture, Small group discussion	Written/ Viva voce			
Topic: Fluid and electrolyte balance **Number of competencies:(07)** **Number of procedures that require certification:(NIL)**									
PE15.1	Discuss the fluid and electrolyte requirement in health and disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PE15.2	Discuss the clinical features and complications of fluid and electrolyte imbalance and outline the management	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PE15.3	Calculate the fluid and electrolyte requirement in health	S	SH	Y	Bedside clinics, Small group discussion	Skill Assessment			
PE15.4	Interpret electrolyte report	S	SH	Y	Bedside clinics, Small group discussion	Skill Assessment			
PE15.5	Calculate fluid and electrolyte imbalance	S	SH	Y	Bedside clinics, Small group discussion	Skill Assessment			
PE15.6	Demonstrate the steps of inserting an IV cannula in a model	S	SH	Y	Skills Lab	mannequin			
PE15.7	Demonstrate the steps of inserting an interosseous line in a mannequin	S	SH	Y	Skills Lab	mannequin			
Topic: Integrated Management of Neonatal and Childhood Illnesses (IMNCI) Guideline **Number of competencies:(03)** **Number of procedures that require certification: (NIL)**									
PE16.1	Explain the components of Integrated Management of Neonatal and Childhood Illnesses (IMNCI) guidelines and method of Risk stratification	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			

Number	**COMPETENCY** **The student should be able to**	**Domain K/S/A/C**	**Level K/KH/ SH/P**	**Core Y/N**	**Suggested Teaching Learning methods**	**Suggested Assessment methods**	**Number required to certify P**	**Vertical Integration**	**Horizontal Integration**
PE16.2	Assess children <2 months using IMNCI Guidelines	S	SH	Y	DOAP session	Document in log Book			
PE16.3	Assess children >2 to 5 years using IMNCI guidelines and Stratify Risk	S	SH	Y	DOAP session	Document in log Book			
Topic: The National Health programs, NHM		**Number of competencies:(02)**				**Number of procedures that require certification: (NIL)**			
PE17.1	State the vision and outline the goals, strategies and plan of action of NHM and other important national programs pertaining to maternal and child health including RMNCH A+, RBSK, RKSK, JSSK mission Indradhanush and ICDS	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine	
PE17.2	Analyse the outcomes and appraise the monitoring and evaluation of NHM	K	KH	Y	Debate	Written/ Viva voce		Community Medicine	
Topic: The National Health Programs: RCH		**Number of competencies: (08)**				**Number of procedures that require certification: (NIL)**			
PE18.1	List and explain the components, plan, outcome of Reproductive Child Health (RCH) program and appraise its monitoring and evaluation	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine	Obstetrics & Gynaecology
PE18.2	Explain preventive interventions for child survival and safe motherhood	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine	Obstetrics & Gynaecology
PE18.3	Conduct Antenatal examination of women independently and apply at-risk approach in antenatal care	S	SH	Y	Bedside clinics	Skill station		Community Medicine	Obstetrics & Gynaecology
PE18.4	Provide intra-natal care and conduct a normal delivery in a simulated environment	S	SH	Y	DOAP session, Skills lab	Document in Log Book		Community Medicine	Obstetrics & Gynaecology
PE18.5	Provide intra-natal care and observe the conduct of a normal delivery	S	SH	Y	DOAP session	Document in Log Book			Obstetrics & Gynaecology

Number	**COMPETENCY** **The student should be able to**	**Domain K/S/A/C**	**Level K/KH/ SH/P**	**Core Y/N**	**Suggested Teaching Learning methods**	**Suggested Assessment methods**	**Number required to certify P**	**Vertical Integration**	**Horizontal Integration**
PE18.6	Perform Postnatal assessment of newborn and mother, provide advice on breast feeding, weaning and on family planning	S	SH	Y	Bed side clinics, Skill Lab	Skill Assessment		Community Medicine	Obstetrics & Gynaecology
PE18.7	Educate and counsel caregivers of children	A	SH	Y	Postnatal ward, standardized patient	Skill Assessment		AETCOM	
PE18.8	Observe the implementation of the program by visiting the Rural Health Centre	S	KH	Y	Bed side clinics, Skill Lab	Document in log book		Community Medicine	Obstetrics & Gynaecology
Topic: National Programs, RCH - Universal Immunizations program Number of competencies: (16) Number of procedures that require certification: (01)									
PE19.1	Explain the components of the Universal Immunization Program and the National Immunization Program	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine, Microbiology, Biochemistry	
PE19.2	Explain the epidemiology of Vaccine preventable diseases	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine, Microbiology, Biochemistry	
PE19.3	Vaccine description with regard to classification of vaccines, strain used, dose, route, schedule, risks, benefits and side effects, indications and contraindications	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine, Microbiology, Biochemistry	
PE19.4	Define cold chain and discuss the methods of safe storage and handling of vaccines	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine, Microbiology, Biochemistry	
PE19.5	Discuss immunization in special situations – HIV positive children, immunodeficiency, pre-term, organ transplants, those who received blood and blood products, splenectomised children, adolescents, travellers	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine, Microbiology, Biochemistry	
PE19.6	Assess patient for fitness for immunization and prescribe an age appropriate immunization schedule	S	P	Y	Out Patient clinics Skills lab	Skill Assessment	5		

Number	**COMPETENCY** **The student should be able to**	**Domain K/S/A/C**	**Level K/KH/ SH/P**	**Core Y/N**	**Suggested Teaching Learning methods**	**Suggested Assessment methods**	**Number required to certify P**	**Vertical Integration**	**Horizontal Integration**
PE19.7	Educate and counsel a patient for immunization	A/C	SH	Y	DOAP session	Document in Log Book			
PE19.8	Demonstrate willingness to participate in the National and sub national immunisation days	A	SH	Y	Lecture, Small group discussion	Document in Log Book		Community Medicine	
PE19.9	Describe the components of safe vaccine practice – Patient education/ counselling; adverse events following immunization, safe injection practices, documentation and Medico-legal implications	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			AETCOM
PE19.10	Observe the handling and storing of vaccines	S	SH	Y	DOAP session	Written/ Viva voce			
PE19.11	Document Immunization in an immunization record	S	SH	Y	Out Patient clinics, Skills lab	Skill assessment			
PE19.12	Observe the administration of UIP vaccines	S	SH	Y	DOAP session	Document in Log Book		Community Medicine	
PE19.13	Demonstrate the correct administration of different vaccines in a mannequin	S	SH	Y	DOAP session	Document in Log Book			
PE19.14	Practice Infection control measures and appropriate handling of the sharps	S	SH	Y	DOAP session	Document in Log Book			
PE19.15	Explain the term implied consent in Immunization services	K	K	Y	Small group discussion	Written/ Viva voce			
PE19.16	Enumerate available newer vaccines and their indications including pentavalent pneumococcal, rotavirus, JE, typhoid IPV & HPV	K	K	N	Lecture, Small group discussion	Written/ Viva voce			
Topic: Care of the Normal New born, and High risk New born **Number of competencies: (20)** **Number of procedures that require certification: (NIL)**									

Number	**COMPETENCY** **The student should be able to**	**Domain K/S/A/C**	**Level K/KH/ SH/P**	**Core Y/N**	**Suggested Teaching Learning methods**	**Suggested Assessment methods**	**Number required to certify P**	**Vertical Integration**	**Horizontal Integration**
PE20.1	Define the common neonatal nomenclatures including the classification and describe the characteristics of a Normal Term Neonate and High Risk Neonates	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PE20.2	Explain the care of a normal neonate	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PE20.3	Perform Neonatal resuscitation in a manikin	S	SH	Y	DOAP session	Log book entry of Performance			
PE20.4	Assessment of a normal neonate	S	SH	Y	Bedside clinics, Skills lab	Skill Assessment			
PE20.5	Counsel / educate mothers on the care of neonates	A/C	SH	Y	DOAP session	Log book documentation			
PE20.6	Explain the follow up care for neonates including Breast Feeding, Temperature maintenance, immunization, importance of growth monitoring and red flags	S	SH	Y	DOAP session	Log book entry			Obstetrics & Gynaecology
PE20.7	Discuss the etiology, clinical features and management of Birth asphyxia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PE20.8	Discuss the etiology, clinical features and management of respiratory distress in New born including meconium aspiration and transient tachypnoea of newborn	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PE20.9	Discuss the etiology, clinical features and management of Birth injuries	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PE20.10	Discuss the etiology, clinical features and management of Hemorrhagic disease of New born	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			

Number	**COMPETENCY** **The student should be able to**	**Domain K/S/A/C**	**Level K/KH/ SH/P**	**Core Y/N**	**Suggested Teaching Learning methods**	**Suggested Assessment methods**	**Number required to certify P**	**Vertical Integration**	**Horizontal Integration**
PE20.11	Discuss the clinical characteristics, complications and management of Low birth weight (preterm and Small for gestation)	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PE20.12	Discuss the temperature regulation in neonates, clinical features and management of Neonatal Hypothermia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PE20.13	Discuss the temperature regulation in neonates, clinical features and management of Neonatal Hypoglycemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PE20.14	Discuss the etiology, clinical features and management of Neonatal hypocalcemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PE20.15	Discuss the etiology, clinical features and management of Neonatal seizures	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PE20.16	Discuss the etiology, clinical features and management of Neonatal Sepsis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PE20.17	Discuss the etiology, clinical features and management of Perinatal infections	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PE20.18	Identify and stratify risk in a sick neonate using IMNCI guidelines	S	SH	Y	DOAP session	Document in Log Book			
PE20.19	Discuss the etiology, clinical features and management of Neonatal hyperbilirubinemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PE20.20	Identify clinical presentations of common surgical conditions in the new born including TEF, esophageal atresia, anal atresia, cleft lip and palate, congenital diaphragmatic hernia and causes of acute abdomen	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
Topic: Genito-Urinary system			**Number of competencies: (17)**			**Number of procedures that require certification: (NIL)**			

Number	**COMPETENCY** **The student should be able to**	**Domain K/S/A/C**	**Level K/KH/ SH/P**	**Core Y/N**	**Suggested Teaching Learning methods**	**Suggested Assessment methods**	**Number required to certify P**	**Vertical Integration**	**Horizontal Integration**
PE21.1	Enumerate the etio-pathogenesis, clinical features, complications and management of Urinary Tract infection in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology	
PE21.2	Enumerate the etio-pathogenesis, clinical features, complications and management of acute post-streptococcal Glomerular Nephritis in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
PE21.3	Discuss the approach and referral criteria to a child with Proteinuria	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
PE21.4	Discuss the approach and referral criteria to a child with Hematuria	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy	
PE21.5	Enumerate the etio-pathogenesis, clinical features, complications and management of Acute Renal Failure in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
PE21.6	Enumerate the etio-pathogenesis, clinical features, complications and management of Chronic Renal Failure in Children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
PE21.7	Enumerate the etio-pathogenesis, clinical features, complications and management of Wilms Tumor	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
PE21.8	Elicit, document and present a history pertaining to diseases of the Genitourinary tract	S	SH	Y	Bedside clinics, Skills lab	Skill Assessment			General Surgery
PE21.9	Identify external markers for Kidney disease, like Failing to thrive, hypertension, pallor, Icthyosis, anasarca	S	SH	Y	Bedside clinics, Skills lab	Document in log book			
PE21.10	Analyse symptom and interpret the physical findings and arrive at an appropriate provisional / differential diagnosis	S	SH	Y	Bedside clinics, Skills lab	Log book			
PE21.11	Perform and interpret the common analytes in a Urine examination	S	SH	Y	Bedside clinics, Skills lab	Skill assessment		Biochemistry, Pathology	
PE21.12	Interpret report of Plain X Ray of KUB	S	SH	Y	Bedside clinics, Skills lab	Log book		Radiodiagnosis	

Number	**COMPETENCY** **The student should be able to**	**Domain K/S/A/C**	**Level K/KH/ SH/P**	**Core Y/N**	**Suggested Teaching Learning methods**	**Suggested Assessment methods**	**Number required to certify P**	**Vertical Integration**	**Horizontal Integration**
PE21.13	Enumerate the indications for and Interpret the written report of Ultra sonogram of KUB	S	SH	Y	Bedside clinics, Skills lab	Log book		Radiodiagnosis	
PE21.14	Recognize common surgical conditions of the abdomen and genitourinary system and enumerate the indications for referral including acute and subacute intestinal obstruction, appendicitis, pancreatitis, perforation intussusception, Phimosis, undescended testis, Chordee, hypospadiasis, Torsion testis, hernia Hydrocele, Vulval Synechiae	S	SH	Y	Bedside clinics, Skills lab	Log book assessment			General Surgery
PE21.15	Discuss and enumerate the referral criteria for children with genitourinary disorder	S	SH	Y	Bedside clinics, Skills lab	Log book assessment			
PE21.16	Counsel / educate a patient for referral appropriately	A/C	SH	Y	DOAP session	Document in Log book		AETCOM	
PE21.17	Describe the etiopathogenesis, grading, clinical features and management of hypertension in children	K	KH	Y	Lecture, Small group discussion	Short notes			
Topic: Approach to and recognition of a child with possible Rheumatologic problem **Number of competencies: (03)** **Number of procedures that require certification:(NIL)**									
PE22.1	Enumerate the common Rheumatological problems in children. Discuss the clinical approach to recognition and referral of a child with Rheumatological problem	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PE22.2	Counsel a patient with Chronic illness	S	SH	N	Bedside clinics Skills lab	Log book			
PE22.3	Describe the diagnosis and management of common vasculitic disorders including Henoch Schonlein Purpura, Kawasaki Disease, SLE, JIA	K	K	N	Lecture, Small group discussion	Written/ Viva voce			
Topic: Cardiovascular system- Heart Diseases **Number of competencies: (18)** **Number of procedures that require certification:(NIL)**									
PE23.1	Discuss the Hemodynamic changes, clinical presentation, complications and management of Acyanotic Heart Diseases –VSD, ASD and PDA	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Pathology	

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PE23.2	Discuss the Hemodynamic changes, clinical presentation, complications and management of Cyanotic Heart Diseases – Fallot's Physiology	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Pathology	
PE23.3	Discuss the etio-pathogenesis, clinical presentation and management of cardiac failure in infant and children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Pathology	
PE23.4	Discuss the etio-pathogenesis, clinical presentation and management of Acute Rheumatic Fever in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Pathology	
PE23.5	Discuss the clinical features, complications, diagnosis, management and prevention of Acute Rheumatic Fever	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Pathology	
PE23.6	Discuss the etio-pathogenesis, clinical features and management of Infective endocarditis in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Pathology, Microbiology	
PE23.7	Elicit appropriate history for a cardiac disease, analyse the symptoms e.g. breathlessness, chest pain, tachycardia, feeding difficulty, failing to thrive, reduced urinary output, swelling, syncope, cyanotic spells, Suck rest cycle, frontal swelling in infants. Document and present	S	SH	Y	Bedside clinics, Skills lab	Skill Assessment			
PE23.8	Identify external markers of a cardiac disease e.g. Cyanosis, Clubbing, dependent edema, dental caries, arthritis, erythema rash, chorea, subcutaneous nodules, Oslers node, Janeway lesions and document	S	SH	Y	Bedside clinics, Skills Lab	Skill Assessment			
PE23.9	Record pulse, blood pressure, temperature and respiratory rate and interpret as per the age	S	SH	Y	Bedside clinics, Skills lab	Skill Assessment			
PE23.10	Perform independently examination of the cardiovascular system – look for precordial bulge, pulsations in the precordium, JVP and its significance in children and infants, relevance of percussion in Pediatric examination, Auscultation and other system examination and document	S	SH	Y	Bedside clinics, Skills lab	Skill station			

Number	**COMPETENCY** **The student should be able to**	**Domain K/S/A/C**	**Level K/KH/ SH/P**	**Core Y/N**	**Suggested Teaching Learning methods**	**Suggested Assessment methods**	**Number required to certify P**	**Vertical Integration**	**Horizontal Integration**
PE23.11	Develop a treatment plan and prescribe appropriate drugs including fluids in cardiac diseases, anti -failure drugs, and inotropic agents	S	SH	Y	Bedside clinics, Skills lab	log book			
PE23.12	Interpret a chest X ray and recognize Cardiomegaly	S	SH	Y	Bedside clinics, Skills lab	Log book entry		Radiodiagnosis	
PE23.13	Choose and Interpret blood reports in Cardiac illness	S	P	Y	Bedside clinics, Small group discussion	Log book entry			
PE23.14	Interpret Pediatric ECG	S	SH	Y	Bedside clinics, Skills lab	Log book entry			
PE23.15	Use the ECHO reports in management of cases	S	SH	Y	Bedside clinics	Log book entry		Radiodiagnosis	
PE23.16	Discuss the indications and limitations of Cardiac catheterization	K	K	N	Small group discussion	Viva voce			
PE23.17	Enumerate some common cardiac surgeries like BT shunt, Potts and Waterston's and corrective surgeries	K	K	N	Small group discussion	Viva voce			
PE23.18	Demonstrate empathy while dealing with children with cardiac diseases in every patient encounter	A	SH	Y	Small group discussion	Document in Log Book		AETCOM	
Topic:Diarrhoeal diseases and Dehydration		**Number of competencies: (17)**				**Number of procedures that require certification:(03)**			
PE24.1	Discuss the etio-pathogenesis, classification, clinical presentation and management of diarrheal diseases in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Microbiology	
PE24.2	Discuss the classification and clinical presentation of various types of diarrheal dehydration	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Microbiology	

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PE24.3	Discuss the physiological basis of ORT, types of ORS and the composition of various types of ORS	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PE24.4	Discuss the types of fluid used in Paediatric diarrheal diseases and their composition	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PE24.5	Discuss the role of antibiotics, antispasmodics, anti-secretory drugs, probiotics, anti-emetics in acute diarrheal diseases	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology, Microbiology	
PE24.6	Discuss the causes, clinical presentation and management of persistent diarrhoea in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology	
PE24.7	Discuss the causes, clinical presentation and management of chronic diarrhoea in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PE24.8	Discuss the causes, clinical presentation and management of dysentery in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology, Microbiology	
PE24.9	Elicit, document and present history pertaining to diarrheal diseases	S	SH	Y	Bedside clinics, Skills lab	Skill assessment			
PE24.10	Assess for signs of dehydration, document and present	S	SH	Y	Bedside clinics, Skills lab	Skill assessment			
PE24.11	Apply the IMNCI guidelines in risk stratification of children with diarrheal dehydration and refer	S	SH	Y	Bedside clinics, Skills lab	Document in Log book			
PE24.12	Perform and interpret stool examination including Hanging Drop	S	SH	N	Bedside clinics, Skills lab	Log book		Microbiology	
PE24.13	Interpret RFT and electrolyte report	S	SH	Y	Bedside clinics, Small group discussion	Document in Log Book			
PE24.14	Plan fluid management as per the WHO criteria	S	SH	Y	Bedside clinics, Small group activity	Skills Station			

Number	**COMPETENCY** **The student should be able to**	**Domain K/S/A/C**	**Level K/KH/ SH/P**	**Core Y/N**	**Suggested Teaching Learning methods**	**Suggested Assessment methods**	**Number required to certify P**	**Vertical Integration**	**Horizontal Integration**
PE24.15	Perform NG tube insertion in a manikin	S	P	Y	DOAP session	Document in Log book	2		
PE24.16	Perform IV cannulation in a model	S	P	Y	DOAP session	Document in Log book	2		
PE24.17	Perform Interosseous insertion model	S	P	Y	DOAP session	Document in Log book	2		
Topic: Malabsorption		**Number of competencies: (01)**			**Number of procedures that require certification:(NIL)**				
PE25.1	Discuss the etio-pathogenesis, clinical presentation and management of Malabsorption in Children and its causes including celiac disease	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Pathology	
Topic: Acute and chronic liver disorders		**Number of competencies: (13)**			**Number of procedures that require certification: (NIL)**				
PE26.1	Discuss the etio-pathogenesis, clinical features and management of acute hepatitis in children	K	KH	Y	Lecture, Small group activity	Written/ Viva voce		Pathology, Microbiology	
PE26.2	Discuss the etio-pathogenesis, clinical features and management of Fulminant Hepatic Failure in children	K	KH	Y	Lecture, Small group activity	Written/ Viva voce		Pathology, Microbiology	
PE26.3	Discuss the etio-pathogenesis, clinical features and management of chronic liver diseases in children	K	KH	Y	Lecture, Small group activity	Written/ Viva voce		Pathology, Microbiology	
PE26.4	Discuss the etio-pathogenesis, clinical features and management of Portal Hypertension in children	K	KH	Y	Lecture, Small group activity	Written/ Viva voce		Pathology	
PE26.5	Elicit document and present the history related to diseases of Gastrointestinal system	S	SH	Y	Bedside clinics, Skills lab	Skills Station			
PE26.6	Identify external markers for GI and Liver disorders e.g.. Jaundice, Pallor, Gynaecomastia, Spider angioma, Palmar erythema, Icthyosis, Caput medusa, Clubbing, Failing to thrive, Vitamin A and D deficiency	S	SH	Y	Bedside clinics, Skills lab	Skill Assessment			

Number	**COMPETENCY** **The student should be able to**	**Domain K/S/A/C**	**Level K/KH/ SH/P**	**Core Y/N**	**Suggested Teaching Learning methods**	**Suggested Assessment methods**	**Number required to certify P**	**Vertical Integration**	**Horizontal Integration**
PE26.7	Perform examination of the abdomen, demonstrate organomegaly, ascites etc.	S	SH	Y	Bedside clinics, Skills lab	Skill Assessment			
PE26.8	Analyse symptoms and interpret physical signs to make a provisional/ differential diagnosis	S	SH	Y	Bedside clinics, Skill lab	Skill Assessment			
PE26.9	Interpret Liver Function Tests, viral markers, ultra sonogram report	S	SH	Y	Bedside clinics, Skills lab	Skill Assessment		Pathology	
PE26.10	Demonstrate the technique of liver biopsy in a Perform Liver Biopsy in a simulated environment	S	SH	Y	DOAP session	Document in log book			
PE26.11	Enumerate the indications for Upper GI endoscopy	K	K	N	Small group discussion	Viva voce			
PE26.12	Discuss the prevention of Hep B infection – Universal precautions and Immunisation	K	KH	Y	Lecture, Small group activity	Written/ Viva voce		Microbiology	
PE26.13	Counsel and educate patients and their family appropriately on liver diseases	A/C	P	y	Bedside clinics, Skills lab	Document in log book			
Topic: Pediatric Emergencies – Common Pediatric Emergencies **Number of competencies: (35)** **Number of procedures that require certification:(10)**									
PE27.1	List the common causes of morbidity and mortality in the under five children	K	K	Y	Lecture, Small group discussion	Written/ Viva voce			
PE27.2	Describe the etio-pathogenesis, clinical approach and management of cardiorespiratory arrest in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PE27.3	Describe the etio-pathogenesis of respiratory distress in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			

Number	**COMPETENCY** **The student should be able to**	**Domain K/S/A/C**	**Level K/KH/ SH/P**	**Core Y/N**	**Suggested Teaching Learning methods**	**Suggested Assessment methods**	**Number required to certify P**	**Vertical Integration**	**Horizontal Integration**
PE27.4	Describe the clinical approach and management of respiratory distress in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PE27.5	Describe the etio-pathogenesis, clinical approach and management of Shock in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PE27.6	Describe the etio-pathogenesis, clinical approach and management of Status epilepticus	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PE27.7	Describe the etio-pathogenesis, clinical approach and management of an unconscious child	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PE27.8	Discuss the common types, clinical presentations and management of poisoning in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PE27.9	Discuss oxygen therapy, in Pediatric emergencies and modes of administration	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PE27.10	Observe the various methods of administering Oxygen	S	KH	Y	Demonstration	Document in log book			
PE27.11	Explain the need and process of triage of sick children brought to health facility	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PE27.12	Enumerate emergency signs and priority signs	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PE27.13	List the sequential approach of assessment of emergency and priority signs	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PE27.14	Assess emergency signs and prioritize	S	SH	Y	DOAP session, Skills lab	Skills Assessment			
PE27.15	Assess airway and breathing: recognise signs of severe respiratory distress. Check for cyanosis, severe chest indrawing, grunting	S	P	Y	DOAP session, Skills lab	Skills Assessment	3		

Number	**COMPETENCY** **The student should be able to**	**Domain K/S/A/C**	**Level K/KH/ SH/P**	**Core Y/N**	**Suggested Teaching Learning methods**	**Suggested Assessment methods**	**Number required to certify P**	**Vertical Integration**	**Horizontal Integration**
PE27.16	Assess airway and breathing. Demonstrate the method of positioning of an infant & child to open airway in a simulated environment	S	P	Y	DOAP session, Skills Lab	Skills Assessment	3		
PE27.17	Assess airway and breathing: administer oxygen using correct technique and appropriate flow rate	S	P	Y	DOAP session, Skills Lab	Skills Assessment	3		
PE27.18	Assess airway and breathing: perform assisted ventilation by Bag and mask in a simulated environment	S	P	Y	DOAP session, Skills lab	Skills Assessment	3		
PE27.19	Check for signs of shock i.e. pulse, Blood pressure, CRT	S	P	Y	DOAP session, Skills Lab	Skills Assessment	3		
PE27.20	Secure an IV access in a simulated environment	S	P	Y	DOAP session, Skills Lab	Skills Assessment	3		
PF27.21	Choose the type of fluid and calculate the fluid requirement in shock	S	P	Y	DOAP session, Small group activity	Skills Assessment	3		
PE27.22	Assess level of consciousness & provide emergency treatment to a child with convulsions/ coma - Position an unconscious child - Position a child with suspected trauma - Administer IV/per rectal Diazepam for a convulsing child in a simulated environment	S	P	Y	DOAP session, Skills Lab	Skills Assessment	3		
PE27.23	Assess for signs of severe dehydration	S	P	Y	Bedside clinics, Skills lab	Skill station	3		
PE27.24	Monitoring and maintaining temperature: define hypothermia. Describe the clinical features, complications and management of Hypothermia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PE27.25	Describe the advantages and correct method of keeping an infant warm by skin to skin contact	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			

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PE27.26	Describe the environmental measures to maintain temperature	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PE27.27	Assess for hypothermia and maintain temperature	S	SH	Y	Skills lab	Skills Assessment			
PE27.28	Provide BLS for children in manikin	S	P	Y	Skills Lab		3		
PE.27.29	Discuss the common causes, clinical presentation, medico-legal implications of abuse	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PE27.30	Demonstrate confidentiality with regard to abuse	A	SH	Y	Skills lab, standardized patients	Skills Station			
PE27.31	Assess child for signs of abuse	S	SH	Y	DOAP session, Skills lab	Log book			
PE27.32	Counsel parents of dangerously ill / terminally ill child to break a bad news	S	SH	Y	DOAP session	Document in Log book			
PE27.33	Obtain Informed Consent	S	SH	Y	DOAP session	Document in Log book			
PE27.34	Willing to be a part of the ER team	A	SH	Y	DOAP session	Document in Log book			
PE27.35	Attends to emergency calls promptly	A	SH	Y	DOAP session	Document in Log Book			
Topic: Respiratory system		**Number of competencies: (20)**				**Number of procedures that require certification: (NIL)**			
PE28.1	Discuss the etio-pathogenesis, clinical features and management of Naso pharyngitis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		ENT	
PE28.2	Discuss the etio-pathogenesis of Pharyngo Tonsillitis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		ENT	

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PE28.3	Discuss the clinical features and management of Pharyngo Tonsillitis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		ENT	
PE28.4	Discuss the etio-pathogenesis, clinical features and management of Acute Otitis Media (AOM)	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		ENT	
PE28.5	Discuss the etio-pathogenesis, clinical features and management of Epiglottitis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		ENT	
PE28.6	Discuss the etio-pathogenesis, clinical features and management of Acute laryngo- trachea-bronchitis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		ENT	
PE28.7	Discuss the etiology, clinical features and management of Stridor in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		ENT	
PE28.8	Discuss the types, clinical presentation, and management of foreign body aspiration in infants and children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		ENT	
PE28.9	Elicit, document and present age appropriate history of a child with upper respiratory problem including Stridor	S	SH	Y	Bedside clinics, skill lab	Skill Assessment		ENT	
PE28.10	Perform otoscopic examination of the ear	S	SH	Y	DOAP session	Skills Assessment		ENT	
PE28.11	Perform throat examination using tongue depressor	S	SH	Y	DOAP session	Skills Assessment		ENT	
PE28.12	Perform examination of the nose	S	SH	Y	DOAP session	Skills Assessment		ENT	
PE28.13	Analyse the clinical symptoms and interpret physical findings and make a provisional / differential diagnosis in a child with ENT symptoms	S	SH	Y	Bedside clinics	Skills Assessment			
PE28.14	Develop a treatment plan and document appropriately in a child with upper respiratory symptoms	S	SH	Y	Bedside clinics	Skills Assessment			

Number	**COMPETENCY** **The student should be able to**	**Domain K/S/A/C**	**Level K/KH/ SH/P**	**Core Y/N**	**Suggested Teaching Learning methods**	**Suggested Assessment methods**	**Number required to certify P**	**Vertical Integration**	**Horizontal Integration**
PE28.15	Stratify risk in children with stridor using IMNCI guidelines	S	SH	Y	Bedside clinics	Log book documentation			
PE28.16	Interpret blood tests relevant to upper respiratory problems	S	SH	N	Bedside clinics, Small group discussion	Log book			
PE28.17	Interpret X-ray of the paranasal sinuses and mastoid; and /or use written report in case of management Interpret CXR in foreign body aspiration and lower respiratory tract infection, understand the significance of thymic shadow in pediatric chest X-rays	S	SH	Y	Bedside clinics, Small group discussion	Skills Assessment		ENT, Radiodiagnosis	
PE28.18	Describe the etio-pathogenesis, diagnosis, clinical features, management and prevention of lower respiratory infections including bronchiolitis, wheeze associated LRTI Pneumonia and empyema	S	SH	Y	Bedside clinics, Small group discussion, Lecture	Skill Assessment/ Written/ Viva voce			
PE28.19	Describe the etio-pathogenesis, diagnosis, clinical features, management and prevention of asthma in children	S	SH	Y	Bedside clinics, Small group discussion, Lecture	Skill Assessment/ Written/ Viva voce		Respiratory Medicine	
PE28.20	Counsel the child with asthma on the correct use of inhalers in a simulated environment	S	SH	Y	Bedside clinics, Small group discussion, Lecture	Skills Assessment/ Written/ Viva voce		Respiratory Medicine	
Topic: Anemia and other Hemato-oncologic disorders in children **Number of competencies: (20)** **Number of procedures that require certification: (NIL)**									
PE29.1	Discuss the etio-pathogenesis, clinical features, classification and approach to a child with anaemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
PE29.2	Discuss the etio-pathogenesis, clinical features and management of Iron Deficiency anaemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	

Number	**COMPETENCY** **The student should be able to**	**Domain K/S/A/C**	**Level K/KH/ SH/P**	**Core Y/N**	**Suggested Teaching Learning methods**	**Suggested Assessment methods**	**Number required to certify P**	**Vertical Integration**	**Horizontal Integration**
PE29.3	Discuss the etiopathogenesis, clinical features and management of VIT B12, Folate deficiency anaemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
PE29.4	Discuss the etio-pathogenesis, clinical features and management of Hemolytic anemia, Thalassemia Major, Sickle cell anaemia, Hereditary spherocytosis, Auto-immune hemolytic anaemia and hemolytic uremic syndrome	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
PE29.5	Discuss the National Anaemia Control Program	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine	
PE29.6	Discuss the cause of thrombocytopenia in children: describe the clinical features and management of Idiopathic Thrombocytopenic Purpura (ITP)	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Pathology	
PE29.7	Discuss the etiology, classification, pathogenesis and clinical features of Hemophilia in children	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Pathology	
PE29.8	Discuss the etiology, clinical presentation and management of Acute Lymphoblastic Leukemia in children	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Pathology	
PE29.9	Discuss the etiology, clinical presentation and management of lymphoma in children	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Pathology	
PE29.10	Elicit, document and present the history related to Hematology	S	SH	Y	Bedside clinics, Skills lab	Skills Station			
PE29.11	Identify external markers for hematological disorders e.g.. Jaundice, Pallor, Petechiae purpura, Ecchymosis, Lymphadenopathy, bone tenderness, loss of weight, Mucosal and large joint bleed	S	SH	Y	Bedside clinics, Skills lab	Skill assessment			
PE29.12	Perform examination of the abdomen, demonstrate organomegaly	S	SH	Y	Bedside clinics, Skills lab	Skill assessment			

Number	**COMPETENCY** **The student should be able to**	**Domain K/S/A/C**	**Level K/KH/ SH/P**	**Core Y/N**	**Suggested Teaching Learning methods**	**Suggested Assessment methods**	**Number required to certify P**	**Vertical Integration**	**Horizontal Integration**
PE29.13	Analyse symptoms and interpret physical signs to make a provisional/ differential diagnosis	S	SH	Y	Bedside clinics, Skill lab	Skill assessment			
PE29.14	Interpret CBC, LFT	S	SH	Y	Bedside clinics, Skills lab	Skill assessment			
PE29.15	Perform and interpret peripheral smear	S	SH	Y	DOAP session	Document in log book			
PE29.16	Discuss the indications for Hemoglobin electrophoresis and interpret report	K	K	N	Small group discussion	Viva voce		Biochemistry	
PE29.17	Demonstrate performance of bone marrow aspiration in manikin	S	SH	Y	Skills lab	Document in log Book			
PE29.18	Enumerate the referral criteria for Hematological conditions	S	SH	Y	Bedside clinics, Small group activity	Viva voce			
PE29.19	Counsel and educate patients about prevention and treatment of anemia	A/C	SH	Y	Bedside clinics, Skills lab	Document in log book			
PE29.20	Enumerate the indications for splenectomy and precautions	K	K	N	Small group Activity	Viva voce			
Topic: Systemic Pediatrics-Central Nervous system **Number of competencis: (23)** **Number of procedures that require certification:(NIL)**									
PE30.1	Discuss the etio-pathogenesis, clinical features , complications, management and prevention of meningitis in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology	
PE30.2	Distinguish bacterial, viral and tuberculous meningitis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology	
PE30.3	Discuss the etio-pathogenesis, classification, clinical features, complication and management of Hydrocephalus in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			

Number	**COMPETENCY** **The student should be able to**	**Domain K/S/A/C**	**Level K/KH/ SH/P**	**Core Y/N**	**Suggested Teaching Learning methods**	**Suggested Assessment methods**	**Number required to certify P**	**Vertical Integration**	**Horizontal Integration**
PE30.4	Discuss the etio-pathogenesis, classification, clinical features, and management of Microcephaly in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PE30.5	Enumerate the Neural tube defects. Discuss the causes, clinical features, types, and management of Neural Tube defect	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PE30.6	Discuss the etio-pathogenesis, clinical features, and management of Infantile hemiplegia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PE30.7	Discuss the etio-pathogenesis, clinical features, complications and management of Febrile seizures in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PE30.8	Define epilepsy. Discuss the pathogenesis, clinical types, presentation and management of Epilepsy in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PE30.9	Define status Epilepticus. Discuss the clinical presentation and management	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PE30.10	Discuss the etio-pathogenesis, clinical features and management of Mental retardation in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PE30.11	Discuss the etio-pathogenesis, clinical features and management of children with cerebral palsy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PE30.12	Enumerate the causes of floppiness in an infant and discuss the clinical features, differential diagnosis and management	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PE30.13	Discuss the etio-pathogenesis, clinical features, management and prevention of Poliomyelitis in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology	
PE30.14	Discuss the etio-pathogenesis, clinical features and management of Duchene muscular dystrophy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PE30.15	Discuss the etio-pathogenesis, clinical features and management of Ataxia in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			

Number	**COMPETENCY** **The student should be able to**	**Domain K/S/A/C**	**Level K/KH/ SH/P**	**Core Y/N**	**Suggested Teaching Learning methods**	**Suggested Assessment methods**	**Number required to certify P**	**Vertical Integration**	**Horizontal Integration**
PE30.16	Discuss the approach to and management of a child with headache	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PE30.17	Elicit document and present an age appropriate history pertaining to the CNS	S	SH	Y	Bedside clinics, Skills lab	Skill Assessment			
PE30.18	Demonstrate the correct method for physical examination of CNS including identification of external markers. Document and present clinical findings	S	SH	Y	Bedside clinics, Skills lab	Skill Assessment			
PE30.19	Analyse symptoms and interpret physical findings and propose a provisional / differential diagnosis	S	SH	Y	Bedside clinics, Skills lab	Skill Assessment			
PE30.20	Interpret and explain the findings in a CSF analysis	S	SH	Y	Small group discussion	Log book		Microbiology	
PE30.21	Enumerate the indication and discuss the limitations of EEG, CT, MRI	K	K	N	Bedside clinics	Log book			
PE30.22	Interpret the reports of EEG, CT, MRI	S	SH	Y	Bedside clinics, Skills lab	Log book		Radiodiagnosis	
PE30.23	Perform in a mannequin lumbar puncture. Discuss the indications, contraindication of the procedure	S	SH	Y	Bedside clinics, Skills lab	Skill Assessment			
Topic: Allergic Rhinitis , Atopic Dermatitis, Bronchial Asthma , Urticaria Angioedema		**Number of competencies: (12)**				**Number of procedures that require certification: (NIL)**			
PE31.1	Describe the etio-pathogenesis, management and prevention of Allergic Rhinitis in Children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		ENT	
PE31.2	Recognize the clinical signs of Allergic Rhinitis	S	SH	Y	Bedside clinics' Skill Lab	Skill Assessment		ENT	
PE31.3	Describe the etio-pathogenesis, clinical features and management of Atopic dermatitis in Children	K	KH	Y	Lecture Small group discussion	Written/ Viva voce		ENT	

Number	**COMPETENCY** **The student should be able to**	**Domain K/S/A/C**	**Level K/KH/ SH/P**	**Core Y/N**	**Suggested Teaching Learning methods**	**Suggested Assessment methods**	**Number required to certify P**	**Vertical Integration**	**Horizontal Integration**
PE31.4	Identify Atopic dermatitis and manage	S	SH		Bedside clinics Skills lab	Skill Assessment		Dermatology, Venereology & Leprosy	
PE31.5	Discuss the etio-pathogenesis, clinical types, presentations, management and prevention of childhood Asthma	K	KH	Y	Lecture Small group discussion	Written/ Viva voce			
PE31.6	Recognise symptoms and signs of Asthma	S	SH	Y	Bedside clinic, Small group activity	Skill Assessment			
PE31.7	Develop a treatment plan for Asthma appropriate to clinical presentation & severity	S	SH	Y	Bedside clinic, Small group activity	Skill Assessment			
PE31.8	Enumerate criteria for referral	K	KH	Y	Bedside clinic, Small group activity	Written/ Viva voce			
PE31.9	Interpret CBC and CX Ray in Asthma	S	SH	Y	Bedside clinic, Small group activity	Skill Assessment			
PE31.10	Enumerate the indications for PFT	K	K	N	Bedside clinic, Small group activity	Viva voce			
PE31.11	Observe administration of Nebulisation	S	SH	Y	DOAP session	Document in log book			
PE31.12	Discuss the etio-pathogenesis, clinical features and complications and management of Urticaria Angioedema	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
Topic: Chromosomal Abnormalities		**Number of competencies: (13)**				**Number of procedures that require certification: (NIL)**			
PE32.1	Discuss the genetic basis, risk factors, complications, prenatal diagnosis, management and genetic counselling in Down's Syndrome	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy	

Number	**COMPETENCY** **The student should be able to**	**Domain K/S/A/C**	**Level K/KH/ SH/P**	**Core Y/N**	**Suggested Teaching Learning methods**	**Suggested Assessment methods**	**Number required to certify P**	**Vertical Integration**	**Horizontal Integration**
PE32.2	Identify the clinical features of Down's Syndrome	S	SH	Y	Bedside clinics, Skills lab	log book		General Medicine	
PE32.3	Interpret normal Karyotype and recognize Trisomy 21	S	SH	Y	Bedside clinics, Skills lab	Log book			General Medicine
PE32.4	Discuss the referral criteria and Multidisciplinary approach to management	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PE32.5	Counsel parents regarding 1. Present child 2. Risk in the next pregnancy	A/C	SH	N	Bedside clinics, Skills lab	Log book			
PE32.6	Discuss the genetic basis, risk factors, clinical features, complications, prenatal diagnosis, management and genetic counselling in Turner's Syndrome	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Obstetrics & Gynaecology	
PE32.7	Identify the clinical features of Turner Syndrome	S	SH	N	Bedside clinics, Skills lab	Log book		General Medicine	
PE32.8	Interpret normal Karyotype and recognize the Turner Karyotype	S	SH	N	Bedside clinics, Skills lab	log book		General Medicine, Obstetrics & Gynaecology	
PE32.9	Discuss the referral criteria and multidisciplinary approach to management of Turner Syndrome	K	KH	N	Lecture, Small group discussion	Written/ Viva voce			General Medicine, Obstetrics & Gynaecology
PE32.10	Counsel parents regarding 1. Present child 2. Risk in the next pregnancy	A/C	SH	N	Bedside clinics, Skills lab	Log book			
PE32.11	Discuss the genetic basis, risk factors, complications, prenatal diagnosis, management and genetic counselling in Klineferlter Syndrome	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	

Number	**COMPETENCY** **The student should be able to**	**Domain K/S/A/C**	**Level K/KH/ SH/P**	**Core Y/N**	**Suggested Teaching Learning methods**	**Suggested Assessment methods**	**Number required to certify P**	**Vertical Integration**	**Horizontal Integration**
PE32.12	Identify the clinical features of Klineferlter Syndrome	S	SH	N	Bedside clinics, Skills lab	Log book		General Medicine	
PE32.13	Interpret normal Karyotype and recognize the Klineferlter Karyotype	S	SH	N	Bedside clinics, Skills lab	Log book		General Medicine	
Topic: Endocrinology		**Number of competencies: (11)**				**Number of procedures that require certification: (02)**			
PE33.1	Describe the etio-pathogenesis clinical features, management of Hypothyroidism in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PE33.2	Recognize the clinical signs of Hypothyroidism and refer	S	SH	Y	Bedside clinics, Skill Lab	Skill Assessment			
PE33.3	Interpret and explain neonatal thyroid screening report	S	SH	Y	Bedside clinics, Small group discussion	Skill Assessment			
PE33.4	Discuss the etio-pathogenesis, clinical types, presentations, complication and management of Diabetes mellitus in children	K	KH	Y	Lecture, Small group discussions	Written/ Viva voce			
PE33.5	Interpret Blood sugar reports and explain the diagnostic criteria for Type 1 Diabetes	S	SH	Y	Bedside clinic, small group activity	Skill Assessment			
PE33.6	Perform and interpret Urine Dip Stick for Sugar	S	P	Y	DOAP session	Skill Assessment	3	Biochemistry	
PE33.7	Perform genital examination and recognize Ambiguous Genitalia and refer appropriately	S	SH	Y	Bedside clinic Skills lab	Skill Assessment			
PE33.8	Define precocious and delayed Puberty	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			

Number	**COMPETENCY** **The student should be able to**	**Domain K/S/A/C**	**Level K/KH/ SH/P**	**Core Y/N**	**Suggested Teaching Learning methods**	**Suggested Assessment methods**	**Number required to certify P**	**Vertical Integration**	**Horizontal Integration**
PE33.9	Perform Sexual Maturity Rating (SMR) and interpret	S	SH	Y	Bedside clinics Skills Lab	Skill Assessment			
PE33.10	Recognize precocious and delayed Puberty and refer	S	SH	Y	Bedside clinics Skills Lab	log book			
PE33.11	Identify deviations in growth and plan appropriate referral	S	P	Y	Bedside clinics Skills Lab	log book	2		
Topic:Vaccine preventable Diseases - Tuberculosis		**Number of competencies: (20)**				**Number of procedures that require certification: (03)**			
PE34.1	Discuss the epidemiology, clinical features, clinical types, complications of Tuberculosis in Children and Adolescents	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology	Respiratory Medicine
PE34.2	Discuss the various diagnostic tools for childhood tuberculosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology	Respiratory Medicine
PE34.3	Discuss the various regimens for management of Tuberculosis as per National Guidelines	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology, Community Medicine, Pharmacology	Respiratory Medicine
PE34.4	Discuss the preventive strategies adopted and the objectives and outcome of the National Tuberculosis Control Program	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology, Community Medicine, Pharmacology	Respiratory Medicine
PE34.5	Able to elicit, document and present history of contact with tuberculosis in every patient encounter	S	SH	Y	Bedside clinics, Skill lab	Skill Assessment			Respiratory Medicine
PE34.6	Identify a BCG scar	S	P	Y	Bedside clinics, Skills lab	Skill Assessment	3	Microbiology	Respiratory Medicine
PE34.7	Interpret a Mantoux test	S	P	Y	Bedside clinics Skills lab	Skill assessment	3	Microbiology	Respiratory Medicine
PE34.8	Interpret a Chest Radiograph	S	SH	Y	Bedside clinics Skills lab	Skill assessment		Radiodiagnosis	Respiratory Medicine

Number	**COMPETENCY** **The student should be able to**	**Domain K/S/A/C**	**Level K/KH/ SH/P**	**Core Y/N**	**Suggested Teaching Learning methods**	**Suggested Assessment methods**	**Number required to certify P**	**Vertical Integration**	**Horizontal Integration**
PE34.9	Interpret blood tests in the context of laboratory evidence for tuberculosis	S	SH	N	Bedside clinics, Small group discussion	log book		Microbiology	Respiratory Medicine
PE34.10	Discuss the various samples for demonstrating the organism e.g. Gastric Aspirate, Sputum , CSF, FNAC	K	KH	Y	Bedside clinics, Small group discussion	Written/ Viva voce		Microbiology	Respiratory Medicine
PE34.11	Perform AFB staining	S	P	Y	DOAP session	Log book/Journal	3	Microbiology	Respiratory Medicine
PE34.12	Enumerate the indications and discuss the limitations of methods of culturing M.Tuberculii	K	KH	Y	Small group discussion	Written/ Viva voce		Microbiology	Respiratory Medicine
PE34.13	Enumerate the newer diagnostic tools for Tuberculosis including BACTEC CBNAAT and their indications	K	K	N	Lecture, Small group discussion	Written/ Viva voce			
PE34.14	Enumerate the common causes of fever and discuss the etiopathogenesis, clinical features, complications and management of fever in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology	
PE34.15	Enumerate the common causes of fever and discuss the etiopathogenesis, clinical features, complications and management of child with exanthematous illnesses like Measles, Mumps, Rubella & Chicken pox	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology	
PE34.16	Enumerate the common causes of fever and discuss the etiopathogenesis, clinical features, complications and management of child with Diphtheria, Pertussis, Tetanus.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology	
PE34.17	Enumerate the common causes of fever and discuss the etiopathogenesis, clinical features, complications and management of child with Typhoid	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/N	Suggested Teaching Learning methods	Suggested Assessment methods	Number required to certify P	Vertical Integration	Horizontal Integration
PE34.18	Enumerate the common causes of fever and discuss the etiopathogenesis, clinical features, complications and management of child with Dengue, Chikungunya and other vector born diseases	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology	
PE34.19	Enumerate the common causes of fever and discuss the etiopathogenesis, clinical features, complications and management of children with Common Parasitic infections, malaria, leishmaniasis, filariasis, helminthic infestations, amebiasis, giardiasis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology	
PE34.20	Enumerate the common causes of fever and discuss the etiopathogenesis, clinical features, complications and management of child with Ricketsial diseases	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology	
Topic: The role of the physician in the community		**Number of competencies: (01)**				**Number of procedures that require certification : (NIL)**			
PE35.1	Identify, discuss and defend medicolegal, socio-cultural and ethical issues as they pertain to health care in children (including parental rights and right to refuse treatment)	K	KH	Y	Small group discussion	Written/ Viva voce			
	Column C: K- Knowledge, S – Skill, A - Attitude / professionalism, C- Communication. **Column D: K – Knows, KH - Knows How, SH- Shows how, P- performs independently,** **Column F: DOAP session – Demonstrate, Observe, Assess, Perform.** **Column H: If entry is P: indicate how many procedures must be done independently for certification/ graduation**								
Integration									
	Human Anatomy								
AN25.4	Describe embryological basis of: 1) atrial septal defect, 2)ventricular septal defect , 3)Fallot's tetralogy & 4) tracheo-oesophageal fistula	K	KH	Y	Lecture	Written/ Viva voce		General Medicine, Pediatrics	Physiology

Number	**COMPETENCY** **The student should be able to**	**Domain K/S/A/C**	**Level K/KH/ SH/P**	**Core Y/N**	**Suggested Teaching Learning methods**	**Suggested Assessment methods**	**Number required to certify P**	**Vertical Integration**	**Horizontal Integration**
AN25.5	Describe developmental basis of congenital anomalies, transposition of great vessels, dextrocardia, patent ductus arteriosus and coarctation of aorta	K	KH	Y	Lecture	Written/ Viva voce		General Medicine, Pediatrics	Physiology
AN25.9	Demonstrate surface marking of lines of pleural reflection, Lung borders and fissures, Trachea, Heart borders, Apex beat & surface projection of valves of heart	K/S	SH	Y	Practical	Viva voce/ skill assessment		General Medicine, Pediatrics	Physiology
AN63.2	Describe anatomical basis of congenital hydrocephalus	K	KH	N	Lecture	Written		Pediatrics	Physiology
AN64.3	Describe various types of open neural tube defects with its embryological basis	K	KH	N	Lecture	Written/ Viva voce		Obstetrics & Gynaecology, Pediatrics	
AN74.1	Describe the various modes of inheritance with examples	K	KH	Y	Lecture	Written		General Medicine, Pediatrics	
AN74.2	Draw pedigree charts for the various types of inheritance & give examples of diseases of each mode of inheritance	K	KH	Y	Lecture	Written		General Medicine, Pediatrics	
AN74.4	Describe the genetic basis & clinical features of Achondroplasia, Cystic Fibrosis, Vitamin D resistant rickets, Hemophilia, Duchene's muscular dystrophy & Sickle cell anaemia	K	KH	N	Lecture	Written		General Medicine, Pediatrics	
AN75.1	Describe the structural and numerical chromosomal aberrations	K	KH	Y	Lecture	Written		Pediatrics	
AN75.2	Explain the terms mosaics and chimeras with example	K	KH	N	Lecture	Written		Pediatrics	
AN75.3	Describe the genetic basis & clinical features of Prader Willi syndrome, Edward syndrome & Patau syndrome	K	KH	N	Lecture	Written		Pediatrics	
AN75.4	Describe genetic basis of variation; polymorphism and mutation	K	KH	Y	Lecture	Written		Pediatrics	

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AN75.5	Describe the principles of genetic counselling	K	KH	Y	Lecture	Written		Pediatrics, Obstetrics & Gynaecology	
				Physiology					
PY11.6	Describe physiology of Infancy	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	
PY11.9	Interpret growth charts	K	KH	Y	Small group teaching	Practical/OSPE/ Viva voce		Pediatrics	
PY11.10	Interpret anthropometric assessment of infants	K	KH	Y	Small group teaching	Practical/OSPE/Viva voce		Pediatrics	
				Biochemistry					
BI5.3	Describe the digestion and absorption of dietary proteins	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	
BI5.4	Describe common disorders associated with protein metabolism	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	
BI7.3	Describe gene mutations and basic mechanism of regulation of gene expression	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	
BI7.4	Describe applications of recombinant DNA technology, PCR in the diagnosis and treatment of diseases with genetic basis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics, General Medicine	
BI8.1	Discuss the importance of various dietary components and explain importance of dietary fibre	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Pediatrics, Pathology	
BI8.2	Describe the types and causes of protein energy malnutrition and its effects	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Pediatrics, Pathology	

Number	**COMPETENCY** **The student should be able to**	**Domain K/S/A/C**	**Level K/KH/ SH/P**	**Core Y/N**	**Suggested Teaching Learning methods**	**Suggested Assessment methods**	**Number required to certify P**	**Vertical Integration**	**Horizontal Integration**
BI8.5	Summarize the nutritional importance of commonly used items of food including fruits and vegetables. (macro-molecules & its importance)	K	KH	Y	Lecture , Small group discussion	Written/ Viva voce		Community Medicine, General Medicine, Pediatrics	
BI10.5	Describe antigens and concepts involved in vaccine development	K	KH	Y	Lecture , Small group discussion	Written/ Viva voce		Pathology, Pediatrics, Microbiology	
Pathology									
PA12.2	Describe the pathogenesis of disorders caused by protein calorie malnutrition and starvation	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, Pediatrics	
PA21.2	Classify and describe the etiology, pathogenesis and pathology of vascular and platelet disorders including ITP and hemophilias	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	
PA28.12	Define, classify and describe the genetics, inheritance etiology, pathogenesis, pathology, laboratory, urinary findings, distinguishing features, progression and complications of cystic disease of the kidney	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Pediatrics	
PA28.14	Classify and describe the etiology, genetics, pathogenesis, pathology, presenting features, progression and spread of renal tumors	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	
PA31.4	Enumerate and describe the etiology, hormonal dependency and pathogenesis of gynecomastia	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Pediatrics, General Medicine	
PA35.2	Classify and describe the etiology, genetics, pathogenesis, pathology, presentation sequelae and complications of CNS tumors	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	
Microbiology									

Number	**COMPETENCY** **The student should be able to**	**Domain K/S/A/C**	**Level K/KH/ SH/P**	**Core Y/N**	**Suggested Teaching Learning methods**	**Suggested Assessment methods**	**Number required to certify P**	**Vertical Integration**	**Horizontal Integration**
MI1.8	Describe the mechanisms of immunity and response of the host immune system to infections	K	KH	Y	Lecture	Written/ Viva voce		Pediatrics	Pathology
MI1.9	Discuss the immunological basis of vaccines and describe the Universal Immunisation schedule	K	KH	Y	Lecture	Written/ Viva voce		Paediatrics	
MI1.10	Describe the immunological mechanisms in immunological disorder (hypersensitivity, autoimmune disorders and immunodeficiency states) and discuss the laboratory methods used in detection	K	KH	Y	Lecture	Written/ Viva voce		Paediatrics	
MI3.1	Enumerate the microbial agents causing diarrhea and dysentery. Describe the epidemiology, morphology, pathogenesis, clinical features, and diagnostic modalities of these agents	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Paediatrics	Pathology
MI3.2	Identify the common etiologic agents of diarrhea and dysentery	S	SH	Y	DOAP session	Skill assessment		General Medicine, Paediatrics	
MI5.1	Describe the etiopathogenesis, clinical course and discuss the laboratory diagnosis of meningitis	K	KH	Y	Lecture	Written/ Viva voce		General Medicine, Paediatrics	Pathology
MI5.2	Describe the etiopathogenesis, clinical course and discuss the laboratory diagnosis of encephalitis	K	KH	Y	Lecture	Written/ Viva voce		General Medicine, Paediatrics	Pathology
MI5.3	Identify the microbial agents causing meningitis	S	SH	Y	DOAP session	Skill assessment		General Medicine, Paediatrics	
Pharmacology									
PH1.12	Calculate the dosage of drugs using appropriate formulae for an individual patient, including children, elderly and patient with renal dysfunction	K/S	SH	Y	Lecture, practical	Written/ Viva voce		Pediatrics, General Medicine	

Number	**COMPETENCY** **The student should be able to**	**Domain K/S/A/C**	**Level K/KH/ SH/P**	**Core Y/N**	**Suggested Teaching Learning methods**	**Suggested Assessment methods**	**Number required to certify P**	**Vertical Integration**	**Horizontal Integration**
PH1.43	Describe and discuss the rational use of antimicrobials including antibiotic stewardship program	K	KH	Y	Lecture	Written/ Viva voce		General Medicine Pediatrics	Microbiology
PH1.56	Describe basic aspects of Geriatric and Pediatric pharmacology	K	KH	Y	Lecture	Written/ Viva voce		Pediatrics	
PH2.4	Demonstrate the correct method of calculation of drug dosage in patients including those used in special situations	S	SH	Y	DOAP sessions	Skills assessment		Pharmacology, General Medicine	
	Community Medicine								
CM3.3	Describe the aetiology and basis of water borne diseases /jaundice/hepatitis/ diarrheal diseases	K	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce		Microbiology, General Medicine, Pediatrics	
CM5.1	Describe the common sources of various nutrients and special nutritional requirements according to age, sex, activity, physiological conditions	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Pediatrics	
CM5.2	Describe and demonstrate the correct method of performing a nutritional assessment of individuals, families and the community by using the appropriate method	S	SH	Y	DOAP session	Skill Assessment		General Medicine, Pediatrics	
CM5.3	Define and describe common nutrition related health disorders (including macro-PEM, Micro-iron, Zn, iodine, Vit. A), their control and management.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Pediatrics	
CM5.4	Plan and recommend a suitable diet for the individuals and families based on local availability of foods and economic status, etc in a simulated environment	S	SH	Y	DOAP session	Skill Assessment		General Medicine, Pediatrics	

Number	**COMPETENCY** **The student should be able to**	**Domain K/S/A/C**	**Level K/KH/ SH/P**	**Core Y/N**	**Suggested Teaching Learning methods**	**Suggested Assessment methods**	**Number required to certify P**	**Vertical Integration**	**Horizontal Integration**
CM5.5	Describe the methods of nutritional surveillance, principles of nutritional education and rehabilitation in the context of socio-cultural factors	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Pediatrics	
CM5.6	Enumerate and discuss the National Nutrition Policy, important national nutritional Programs including the Integrated Child Development Services Scheme (ICDS) etc	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	
CM5.8	Describe and discuss the importance and methods of food fortification and effects of additives and adulteration	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	
CM6.1	Formulate a research question for a study	K	KH	Y	Small group, Lecture, DOAP session	Written/ Viva voce/ Skill Assessment		General Medicine, Pediatrics	
CM6.2	Describe and discuss the principles and demonstrate the methods of collection, classification, analysis, interpretation and presentation of statistical data	S	SH	Y	Small group discussion, Lecture, DOAP session	Written/ Viva voce/ Skill Assessment		General Medicine, Pediatrics	
CM6.3	Describe, discuss and demonstrate the application of elementary statistical methods including test of significance in various study designs	S	SH	Y	Small group discussion, Lecture, DOAP session	Written/ Viva voce/ Skill Assessment		General Medicine, Pediatrics	
CM6.4	Enumerate, discuss and demonstrate common sampling techniques, simple statistical methods, frequency distribution, measures of central tendency and dispersion	S	SH	Y	Small group discussion, Lecture, DOAP session	Written/ Viva voce/ Skill Assessment		General Medicine, Pediatrics	
CM8.1	Describe and discuss the epidemiological and control measures including the use of essential laboratory tests at the primary care level for communicable diseases	K	KH	Y	Small group discussion, Lecture	Written/ Viva voce		General Medicine, Pediatrics	Microbiology, Pathology
CM8.3	Enumerate and describe disease specific National Health Programs including their prevention and treatment of a case	K	KH	Y	Small group discussion, Lecture	Written/ Viva voce		General Medicine, Pediatrics	
CM8.4	Describe the principles and enumerate the measures to control a disease epidemic	K	KH	Y	Small group discussion, Lecture	Written/ Viva voce		General Medicine, Pediatrics	

Number	**COMPETENCY** **The student should be able to**	**Domain K/S/A/C**	**Level K/KH/ SH/P**	**Core Y/N**	**Suggested Teaching Learning methods**	**Suggested Assessment methods**	**Number required to certify P**	**Vertical Integration**	**Horizontal Integration**
CM8.5	Describe and discuss the principles of planning, implementing and evaluating control measures for disease at community level bearing in mind the public health importance of the disease	K	KH	Y	Small group discussion, Lecture	Written / Viva voce		General Medicine, Pediatrics	
CM9.2	Define, calculate and interpret demographic indices including birth rate, death rate, fertility rates	S	SH	Y	Lecture, Small group discussion, DOAP sessions	Skill assessment		Obstetrics & Gynaecology, Pediatrics	
CM10.1	Describe the current status of Reproductive, maternal, newborn and Child Health	K	KH	Y	Small group discussion, Lecture	Written/ Viva voce		Obstetrics & Gynaecology, Pediatrics	
CM10.2	Enumerate and describe the methods of screening high risk groups and common health problems	K	KH	Y	Small group discussion, Lecture	Written/ Viva voce		Obstetrics & Gynaecology, Pediatrics	
CM10.3	Describe local customs and practices during pregnancy, childbirth, lactation and child feeding practices	K	KH	Y	Small group discussion, Lecture	Written/ Viva voce		Obstetrics & Gynaecology, Pediatrics	
CM10.4	Describe the reproductive, maternal, newborn & child health (RMCH); child survival and safe motherhood interventions	K	KH	Y	Small group discussion, Lecture	Written/ Viva voce		Obstetrics & Gynaecology, Pediatrics	
CM10.5	Describe Universal Immunization Program; Integrated Management of Neonatal and Childhood Illness (IMNCI) and other existing Programs	K	KH	Y	Small group discussion, Lecture	Written/ Viva voce		Pediatrics	
Forensic Medicine & Toxicology									

Number	**COMPETENCY** **The student should be able to**	**Domain K/S/A/C**	**Level K/KH/ SH/P**	**Core Y/N**	**Suggested Teaching Learning methods**	**Suggested Assessment methods**	**Number required to certify P**	**Vertical Integration**	**Horizontal Integration**
FM1.9	Describe the importance of documentation in medical practice in regard to medicolegal examinations, Medical Certificates and medicolegal reports especially – maintenance of patient case records, discharge summary, prescribed registers to be maintained in Health Centres. -- maintenance of medico-legal register like accident register. -- documents of issuance of wound certificate -- documents of issuance of drunkenness certificate. -- documents of issuance of sickness and fitness certificate. -- documents for issuance of death certificate. -- documents of Medical Certification of Cause of Death - Form Number 4 and 4A -- documents for estimation of age by physical, dental and radiological examination and issuance of certificate	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Radiodiagnosis, General Surgery, General Medicine, Paediatrics	
FM2.27	Define and discuss infanticide, foeticide and stillbirth	K	KH	Y	Lecture, Small group discussions	Written/ Viva voce		Pediatrics	
FM2.28	Describe and discuss signs of intrauterine death, signs of live birth, viability of foetus, age determination of foetus, DOAP session of ossification centres, Hydrostatic test, Sudden infants death syndrome and Munchausen's syndrome by proxy	K	KH	Y	Lecture, Small group discussions, Autopsy, DOAP session	Written/ Viva voce/ OSCE		Pediatrics, Human Anatomy	
FM3.29	Describe and discuss child abuse and battered baby syndrome	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	
Dermatology, Venereology & Leprosy									
DR5.1	Describe the etiology, microbiology, pathogenesis, natural history, clinical features, presentations and complications of scabies	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	
DR5.2	Identify and differentiate scabies from other lesions	S	SH	Y	Bedside clinic	Skill assessment		Pediatrics	

Number	**COMPETENCY** **The student should be able to**	**Domain K/S/A/C**	**Level K/KH/ SH/P**	**Core Y/N**	**Suggested Teaching Learning methods**	**Suggested Assessment methods**	**Number required to certify P**	**Vertical Integration**	**Horizontal Integration**
DR5.3	Enumerate and describe the pharmacology, administration and adverse reaction of pharmacotherapies for scabies	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	Pharmacology
DR6.1	Describe the etiology, pathogenesis and diagnostic features of pediculosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	Microbiology
DR6.2	Identify and differentiate pediculosis from other skin lesions	S	SH	Y	Bedside clinic	Skill assessment		Pediatrics	
DR7.1	Describe the etiology, microbiology, pathogenesis, clinical presentations and diagnostic features of dermatophytes	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	Microbiology
DR8.1	Describe the etiology, microbiology, pathogenesis, clinical presentations and diagnostic features of common viral infections of the skin	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	Microbiology
DR17.1	Enumerate and identify the cutaneous findings in vitamin A deficiency	K/S	SH	Y	Lecture, Small group discussion, Bedside clinic	Skill assessment/ Viva voce		General Medicine, Pediatrics, Biochemistry	
DR17.2	Enumerate and describe the various skin changes in Vitamin B complex deficiency	K	KH	Y	Lecture	Written/ Viva voce		General Medicine, Pediatrics, Biochemistry	
DR17.3	Enumerate and describe the various changes in Vitamin C deficiency	K	KH	Y	Lecture	Written/ Viva voce		General Medicine, Pediatrics, Biochemistry	
DR17.4	Enumerate and describe the various changes in Zinc deficiency	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Pediatrics, Biochemistry	
Anesthesiology									

Number	**COMPETENCY** **The student should be able to**	**Domain K/S/A/C**	**Level K/KH/ SH/P**	**Core Y/N**	**Suggested Teaching Learning methods**	**Suggested Assessment methods**	**Number required to certify P**	**Vertical Integration**	**Horizontal Integration**
AS2.1	Enumerate the indications, describe the steps and demonstrate in a simulated environment basic life support in adults children and neonates	S	SH	N	DOAP session	Skill assessment		General Medicine, Pediatrics	
				Psychiatry					
PS14.1	Enumerate and describe the magnitude and etiology of psychiatric disorders occurring in childhood and adolescence	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	
PS14.2	Enumerate, elicit, describe and document clinical features in patients with psychiatric disorders occurring in childhood and adolescence	S	SH	Y	Bedside clinic, DOAP session	Skill assessment		Pediatrics	
PS14.3	Describe the treatment of stress related disorders including behavioural, psychosocial and pharmacologic therapy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	
PS14.4	Demonstrate family education in a patient with psychiatric disorders occurring in childhood and adolescence in a simulated environment	S	SH	Y	Bedside clinic, DOAP session	Skill assessment		Pediatrics	
PS14.5	Enumerate and describe the pharmacologic basis and side effects of drugs used in psychiatric disorders occurring in childhood and adolescence	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	
PS15.1	Describe the aetiology and magnitude of mental retardation	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	
PS15.2	Describe and discuss intelligence quotient and its measurement	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	
PS15.3	Elicit and document a history and clinical examination and choose appropriate investigations in a patient with mental retardation	K/S	SH	Y	Bedside clinic, DOAP session	Skill assessment		Pediatrics	
PS15.4	Describe the psychosocial interventions and treatment used in mental retardation	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	

Number	**COMPETENCY** **The student should be able to**	**Domain K/S/A/C**	**Level K/KH/ SH/P**	**Core Y/N**	**Suggested Teaching Learning methods**	**Suggested Assessment methods**	**Number required to certify P**	**Vertical Integration**	**Horizontal Integration**
				General Medicine					
IM23.1	Discuss and describe the methods of nutritional assessment in an adult and calculation of caloric requirements during illnesses	K	KH	Y	Lecture, Small group discussions	Written/ Viva voce		Physiology, Biochemistry	Pediatrics
IM23.2	Discuss and describe the causes and consequences of protein caloric malnutrition in the hospital	K	KH	Y	Lecture, Small group discussions	Written/ Viva voce		Physiology, Biochemistry	Pediatrics
IM23.3	Discuss and describe the aetiology, causes, clinical manifestations, complications, diagnosis and management of common vitamin deficiencies	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry	Pediatrics
IM23.4	Enumerate the indications for enteral and parenteral nutrition in critically ill patients	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry	Pediatrics
				Obstetrics & Gynocology					
OG1.2	Define and discuss perinatal mortality and morbidity including perinatal and neonatal mortality and morbidity audit	K	KH	Y	Lecture, Small group discussion	Short notes		Community Medicine	Pediatrics
OG18.1	Describe and discuss the assessment of maturity of the newborn, diagnosis of birth asphyxia, principles of resuscitation, common problems	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Pediatrics
OG18.2	Demonstrate the steps of neonatal resuscitation in a simulated environment	S	SH	Y	DOAP session	Skill assessment			Pediatrics
OG18.3	Describe and discuss the diagnosis of birth asphyxia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Pediatrics
OG18.4	Describe the principles of resuscitation of the newborn and enumerate the common problems encountered	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Pediatrics

Number	**COMPETENCY** **The student should be able to**	**Domain K/S/A/C**	**Level K/KH/ SH/P**	**Core Y/N**	**Suggested Teaching Learning methods**	**Suggested Assessment methods**	**Number required to certify P**	**Vertical Integration**	**Horizontal Integration**
Physical Medicine & Rehabilitation									
PM3.1	Describe and discuss the clinical features, types, evaluation, diagnosis and management of cerebral palsy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy	Pediatrics
PM3.2	Recognize, describe and discuss the spectrum of multiple disability : cognitive, motor, visual and hearing in cerebral palsy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Pediatrics
PM3.3	Recognize, describe and discuss the role of special education in children with learning disabilities	K	K	Y	Lecture, Small group discussion	Written/ Viva voce			Pediatrics
PM3.4	Demonstrate spasticity, rigidity and dystonia in children with cerebral palsy	S	SH	Y	DOAP session, Small group discussion, Bedside clinic	Skill assessment			Pediatrics
PM3.5	Enumerate the indications and describe the therapies for spasticity including medications, serial casts, nerve blocks, botulinum toxin injections	K	KH	Y	Lecture, Small group discussion			Pharmacology	Pediatrics, Orthopedics
PM3.6	Enumerate the indications and describe prevention of joint subluxations and contractures by proper positioning, and use of special chairs, and appliances	K	KH	Y	DOAP session, Small group discussion, Bedside clinic				Pediatrics
PM3.7	Enumerate the first aid measures to be used in patients with seizures	K	K	Y	Lecture, Small group discussion	Written/ Viva voce			Pediatrics
PM4.2	Describe and discuss the principles of management of chronic pain and role of common modalities (moist heat, ultrasound, Short wave diathermy)	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Pediatrics

PSYCHIATRY (CODE: PS)

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
PSYCHIATRY									
Topic: Doctor patient relationship		**Number of competencies: (04)**				**Number of procedures that require certification: (NIL)**			
PS1.1	Establish rapport and empathy with patients	A/C	SH	Y	DOAP session	Skill station			
PS1.2	Describe the components of communication	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PS1.3	Demonstrate breaking of bad news in a simulated environment	A/C	SH	Y	DOAP session	Skill station			
PS1.4	Describe and demonstrate the importance of confidentiality in patient encounters	A/C	SH	Y	DOAP session	Faculty observation			
Topic: Mental health		**Number of competencies: (05)**				**Number of procedures that require certification:(NIL)**			
PS2.1	Define stress and describe its components and causes	K	K	Y	Lecture, Small group discussion	Written/ Viva voce			
PS2.2	Describe the role of time management, study skills, balanced diet and sleep wake habits in stress avoidance	K	KH	Y	Lecture, Small group discussion	Viva voce			
PS2.3	Define and describe the principles and components of learning memory and emotions	K	K	Y	Lecture, Small group discussion	Written/ Viva voce			
PS2.4	Describe the principles of personality development and motivation	K	K	Y	Lecture, Small group discussion	Written/ Viva voce			
PS2.5	Define and distinguish normality and abnormality	K	K	Y	Lecture, Small group discussion	Viva voce			
Topic: Introduction to psychiatry		**Number of competencies: (12)**				**Number of procedures that require certification: (NIL)**			
PS3.1	Describe the growth of psychiatry as a medical specialty, its history and contribution to society	K	KH	Y	Lecture	Written/ Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
PS3.2	Enumerate, describe and discuss important signs & symptoms of common mental disorders	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PS3.3	Elicit, present and document a history in patients presenting with a mental disorder	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			
PS3.4	Describe the importance of establishing rapport with patients	S/A	SH	Y	Bedside clinic, DOAP session	Skill assessment/ Faculty observation			
PS3.5	Perform, demonstrate and document a minimental examination	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			
PS3.6	Describe and discuss biological, psychological & social factors & their interactions in the causation of mental disorders	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PS3.7	Enumerate and describe common organic psychiatric disorders, magnitude, etiology and clinical features	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			General Medicine
PS3.8	Enumerate and describe the essential investigations in patients with organic psychiatric disorders	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			General Medicine
PS3.9	Describe the steps and demonstrate in a simulated environment family education in patients with organic psychiatric disorders	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			
PS3.10	Enumerate and describe the pharmacologic basis and side effects of drugs used in psychiatric disorders	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PS3.11	Enumerate the appropriate conditions for specialist referral in patients with psychiatric disorders	K	K	Y	Lecture, Small group discussion	Written/ Viva voce			
PS3.12	Describe, discuss and distinguish psychotic & non-psychotic (Mood, Anxiety, Stress related) disorders	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
Topic: Psychotic disorders		**Number of competencies: (07)**				**Number of procedures that require certification: (NIL)**			
PS4.1	Describe the magnitude and etiology of alcohol and substance use disorders	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			General Medicine
PS4.2	Elicit, describe and document clinical features of alcohol and substance use disorders	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			General Medicine

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
PS4.3	Enumerate and describe the indications and interpret laboratory and other tests used in alcohol and substance abuse disorders	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			General Medicine
PS4.4	Describe the treatment of alcohol and substance abuse disorders including behavioural and pharmacologic therapy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	General Medicine
PS4.5	Demonstrate family education in a patient with alcohol and substance abuse in a simulated environment	S	SH	Y	Bedside clinic, DOAP session	Skill assessment		AETCOM	
PS4.6	Enumerate and describe the pharmacologic basis and side effects of drugs used in alcohol and substance abuse	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	General Medicine
PS4.7	Enumerate the appropriate conditions for specialist referral in patients with alcohol and substance abuse disorders	K	K	Y	Lecture, Small group discussion	Written/ Viva voce			
Topic: Psychotic disorders		**Number of competencies: (06)**				**Number of procedures that require certification: (NIL)**			
PS5.1	Classify and describe the magnitude and etiology of schizophrenia & other psychotic disorders	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PS5.2	Enumerate, elicit, describe and document clinical features, positive s	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			
PS5.3	Describe the treatment of schizophrenia including behavioural and pharmacologic therapy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
PS5.4	Demonstrate family education in a patient with schizophrenia in a simulated environment	K/S/A/C	SH	Y	Bedside clinic, DOAP session	Skill assessment			
PS5.5	Enumerate and describe the pharmacologic basis and side effects of drugs used in schizophrenia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
PS5.6	Enumerate the appropriate conditions for specialist referral in patients with psychotic disorders	K	K	Y	Lecture, Small group discussion	Written/ Viva voce			
Topic: Depression		**Number of competencies: (07)**				**Number of procedures that require certification: (NIL)**			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
PS6.1	Classify and describe the magnitude and etiology of depression	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PS6.2	Enumerate, elicit, describe and document clinical features in patients with depression	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			
PS6.3	Enumerate and describe the indications and interpret laboratory and other tests used in depression	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			
PS6.4	Describe the treatment of depression including behavioural and pharmacologic therapy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
PS6.5	Demonstrate family education in a patient with depression in a simulated environment	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			
PS6.6	Enumerate and describe the pharmacologic basis and side effects of drugs used in depression	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
PS6.7	Enumerate the appropriate conditions for specialist referral in patients with depression	K	K	Y	Lecture, Small group discussion	Written/ Viva voce			
Topic: Bipolar disorders		**Number of competencies: (07)**				**Number of procedures that require certification: (NIL)**			
PS7.1	Classify and describe the magnitude and etiology of bipolar disorders	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PS7.2	Enumerate, elicit, describe and document clinical features in patients with bipolar disorders	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			
PS7.3	Enumerate and describe the indications and interpret laboratory and other tests used in bipolar disorders	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			
PS7.4	Describe the treatment of bipolar disorders including behavioural and pharmacologic therapy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
PS7.5	Demonstrate family education in a patient with bipolar disorders in a simulated environment	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			
PS7.6	Enumerate and describe the pharmacologic basis and side effects of drugs used in bipolar disorders	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
PS7.7	Enumerate the appropriate conditions for specialist referral in patients with bipolar disorders	K	K	Y	Lecture, Small group discussion	Written/ Viva voce			
Topic: Anxiety disorders		**Number of competencies: (07)**				**Number of procedures that require certification: (NIL)**			
PS8.1	Enumerate and describe the magnitude and etiology of anxiety disorders	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PS8.2	Enumerate, elicit, describe and document clinical features in patients with anxiety disorders	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			
PS8.3	Enumerate and describe the indications and interpret laboratory and other tests used in anxiety disorders	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			
PS8.4	Describe the treatment of anxiety disorders including behavioural and pharmacologic therapy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
PS8.5	Demonstrate family education in a patient with anxiety disorders in a simulated environment	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			
PS8.6	Enumerate and describe the pharmacologic basis and side effects of drugs used in anxiety disorders	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
PS8.7	Enumerate the appropriate conditions for specialist referral in anxiety disorders	K	K	Y	Lecture, Small group discussion	Written/ Viva voce			
Topic: Stress related disorders		**Number of competencies: (07)**				**Number of procedures that require certification: (NIL)**			
PS9.1	Enumerate and describe the magnitude and etiology of stress related disorders	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PS9.2	Enumerate, elicit, describe and document clinical features in patients with stress related disorders	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			
PS9.3	Enumerate and describe the indications and interpret laboratory and other tests used in stress related disorders	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			
PS9.4	Describe the treatment of stress related disorders including behavioural and psychosocial therapy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PS9.5	Demonstrate family education in a patient with stress related disorders in a simulated environment	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
PS9.6	Enumerate and describe the pharmacologic basis and side effects of drugs used in stress related disorders	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PS9.7	Enumerate the appropriate conditions for specialist referral in stress disorders	K	K	Y	Lecture, Small group discussion	Written/ Viva voce			
Topic: Somatoform disorders		**Number of competencies: (07)**			**Number of procedures that require certification: (NIL)**				
PS10.1	Enumerate and describe the magnitude and etiology of somatoform, dissociative and conversion disorders	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			General Medicine
PS10.2	Enumerate, elicit, describe and document clinical features in patients with somatoform, dissociative and conversion disorders	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			General Medicine
PS10.3	Enumerate and describe the indications and interpret laboratory and other tests used in somatoform, dissociative and conversion disorders	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			General Medicine
PS10.4	Describe the treatment of **somatoform** disorders including behavioural, psychosocial and pharmacologic therapy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	General Medicine
PS10.5	Demonstrate family education in a patient with somatoform, dissociative and conversion disorders in a simulated environment	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			
PS10.6	Enumerate and describe the pharmacologic basis and side effects of drugs used in somatoform, dissociative and conversion disorders	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	General Medicine
PS10.7	Enumerate the appropriate conditions for specialist referral in patients with somato form dissociative and conversion disorders	K	K	Y	Lecture, Small group discussion	Written/ Viva voce			
Topic: Personality disorders		**Number of competencies: (07)**			**Number of procedures that require certification: (NIL)**				
PS11.1	Enumerate and describe the magnitude and etiology of personality disorders	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PS11.2	Enumerate, elicit, describe and document clinical features in patients with personality disorders	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
PS11.3	Enumerate and describe the indications and interpret laboratory and other tests used in personality disorders	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			
PS11.4	Describe the treatment of **personalit**y disorders including behavioural, psychosocial and pharmacologic therapy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
PS11.5	Demonstrate family education in a patient with personality disorders in a simulated environment	S/A/C	SH	Y	Bedside clinic, DOAP session	Skill assessment			
PS11.6	Enumerate and describe the pharmacologic basis and side effects of drugs used in personality disorders	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
PS11.7	Enumerate the appropriate conditions for specialist referral	K	K	Y	Lecture, Small group discussion	Written/ Viva voce			
Topic: Psychosomatic disorders		**Number of competencies: (07)**				**Number of procedures that require certification: (NIL)**			
PS12.1	Enumerate and describe the magnitude and etiology of psychosomatic disorders	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			General Medicine
PS12.2	Enumerate, elicit, describe and document clinical features in patients with magnitude and etiology of psychosomatic disorders	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			General Medicine
PS12.3	Enumerate and describe the indications and interpret laboratory and other tests of psychosomatic disorders	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			General Medicine
PS12.4	Describe the treatment of **psychosomatic** disorders including behavioural, psychosocial and pharmacologic therapy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	General Medicine
PS12.5	Demonstrate family education in a patient with psychosomatic disorders in a simulated environment	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			
PS12.6	Enumerate and describe the pharmacologic basis and side effects of drugs used in psychosomatic disorders	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
PS12.7	Enumerate the appropriate conditions for specialist referral	K	K	Y	Lecture, Small group discussion	Written/ Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
Topic: Psychosexual and gender identity disorders		**Number of competencies: (07)**			**Number of procedures that require certification: (NIL)**				
PS13.1	Enumerate and describe the magnitude and etiology of psychosexual and gender identity disorders	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PS13.2	Enumerate, elicit, describe and document clinical features in patients with magnitude and etiology of psychosexual and gender identity disorders	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			
PS13.3	Enumerate and describe the indications and interpret laboratory and other tests used in psychosexual and gender identity disorders	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			
PS13.4	Describe the treatment of psychosexual and gender identity disorders including behavioural, psychosocial and pharmacologic therapy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
PS13.5	Demonstrate family education in a patient with psychosexual and gender identity disorders in a simulated environment	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			
PS13.6	Enumerate and describe the pharmacologic basis and side effects of drugs used in psychosexual and gender identity disorders	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PS13.7	Enumerate the appropriate conditions for specialist referral	K	K	Y	Lecture, Small group discussion	Written/ Viva voce			
Topic: Psychiatric disorders in childhood and adolescence		**Number of competencies: (06)**			**Number of procedures that require certification: (NIL)**				
PS14.1	Enumerate and describe the magnitude and etiology of psychiatric disorders occurring in childhood and adolescence	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	
PS14.2	Enumerate, elicit, describe and document clinical features in patients with psychiatric disorders occurring in childhood and adolescence	S	SH	Y	Bedside clinic, DOAP session	Skill assessment		Pediatrics	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
PS14.3	Describe the treatment of stress related disorders including behavioural, psychosocial and pharmacologic therapy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	
PS14.4	Demonstrate family education in a patient with psychiatric disorders occurring in childhood and adolescence in a simulated environment	S	SH	Y	Bedside clinic, DOAP session	Skill assessment		Pediatrics	
PS14.5	Enumerate and describe the pharmacologic basis and side effects of drugs used in psychiatric disorders occurring in childhood and adolescence	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	
PS14.6	Enumerate the appropriate conditions for specialist referral in children and adolescents with psychiatric disorders	K	K	Y	Lecture, Small group discussion	Written/ Viva voce			
Topic: Mental retardation		**Number of competencies: (04)**			**Number of procedures that require certification: (NIL)**				
PS15.1	Describe the aetiology and magnitude of mental retardation	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	
PS15.2	Describe and discuss intelligence quotient and its measurement	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	
PS15.3	Elicit and document a history and clinical examination and choose appropriate investigations in a patient with mental retardation	K/S	SH	Y	Bedside clinic, DOAP session	Skill assessment		Pediatrics	
PS15.4	Describe the psychosocial interventions and treatment used in mental retardation	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	
Topic: Psychiatric disorders in the elderly		**Number of competencies: (05)**			**Number of procedures that require certification: (NIL)**				
PS16.1	Enumerate and describe common psychiatric disorders in the elderly including dementia, depression and psychosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			General Medicine
PS16.2	Describe the aetiology and magnitude of psychiatric illness in the elderly	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
PS16.3	Describe the therapy of psychiatric illness in elderly including psychosocial and behavioural therapy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
PS16.4	Demonstrate family education in a patient with psychiatric disorders occurring in the elderly in a simulated environment	S	SH	Y	Bedside clinic, DOAP session	Skill assessment		General Medicine	
PS16.5	Enumerate the appropriate conditions for specialist referral in psychiatric disorders in the elderly	K	K	Y	Lecture, Small group discussion	Written/ Viva voce			
Topic: Psychiatric emergencies		**Number of competencies: (03)**				**Number of procedures that require certification: (NIL)**			
PS17.1	Enumerate and describe the recognition and clinical presentation of psychiatric emergencies (Suicide, Deliberate Self Harm, Violent behaviour)	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PS17.2	Describe the initial stabilisation and management of psychiatric emergencies	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PS17.3	Enumerate the appropriate conditions for specialist referral in patients with psychiatric emergencies	K	K	Y	Lecture, Small group discussion	Written/ Viva voce			
Topic: Therapeutics		**Number of competencies: (03)**				**Number of procedures that require certification: (NIL)**			
PS18.1	Enumerate the indications and describe the pharmacology, dose and side effects of commonly use drugs in psychiatric disorders	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharamcology	
PS18.2	Enumerate the indications for modified electroconvulsive therapy	K	K	Y	Lecture, Small group discussion	Written/ Viva voce			
PS18.3	Enumerate and describe the principles and role of psychosocial interventions in psychiatric illness including psychotherapy, behavioural therapy and rehabilitation	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
Topic: Miscellaneous		**Number of competencies: (06)**				**Number of procedures that require certification: (NIL)**			
PS19.1	Describe the relevance, role and status of community psychiatry	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
PS19.2	Describe the objectives strategies and contents of the National Menta	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine	
PS19.3	Describe and discuss the basic legal and ethical issues in psychiatry	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Forensic Medicine & Toxicology, AETCOM	
PS19.4	Enumerate and describe the salient features of the prevalent mental health laws in India	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine	
PS19.5	Describe the concept and principles of preventive psychiatry and mental health promotion (positive mental health); and community education	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine	
PS19.6	Enumerate and describe the identifying features and the principles of participatory management of mental illness occurring during and after disasters	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
	Column C: K- Knowledge, S – Skill, A - Attitude / professionalism, C- Communication. **Column D: K – Knows, KH - Knows How, SH - Shows how, P- performs independently,** **Column F: DOAP session – Demonstrate, Observe, Assess, Perform.** **Column H: If entry is P: indicate how many procedures must be done independently for certification/ graduation**								
Integration									
	Physiology								
PY10.7	Describe and discuss functions of cerebral cortex, basal ganglia, thalamus, hypothalamus, cerebellum and limbic system and their abnormalities	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Psychiatry	Human Anatomy
PY10.8	Describe and discuss behavioural and EEG characteristics during sleep and mechanism responsible for its production	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Psychiatry	
PY10.9	Describe and discuss the physiological basis of memory, learning and speech	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Psychiatry	
PY10.12	Identify normal EEG forms	S	S	Y	Small group teaching	OSPE/Viva voce		Psychiatry	
	Pharmacology								

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
PH1.19	Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of the drugs which act on CNS, (including anxiolytics, sedatives & hypnotics, antipsychotic, antidepressant drugs, antimaniacs, opioid agonists and antagonists, drugs used for neurodegenerative disorders, antiepileptics drugs)	K	KH	Y	Lecture	Written/ Viva voce		Psychiatry, Physiology	
PH1.20	Describe the effects of acute and chronic ethanol intake. Describe the symptoms and management of methanol and ethanol poisonings	K	KH	Y	Lecture, Small group discussions	Written/ Viva voce		Psychiatry	
PH1.22	Describe drugs of abuse (dependence, addiction, stimulants, depressants, psychedelics, drugs used for criminal offences)	K	KH	Y	Lecture, Small group discussions	Written/Viva voce		Psychiatry	Forensic Medicine
PH1.23	Describe the process and mechanism of drug deaddiction	K/ S	KH	Y	Lecture, Small group discussions	Written/Viva voce		Psychiatry	
PH5.5	Demonstrate an understanding of the caution in prescribing drugs likely to produce dependence and recommend the line of management	K	KH	Y	Small group discussion	Short note/Viva voce		Psychiatry	
PH5.6	Demonstrate ability to educate public & patients about various aspects of drug use including drug dependence and OTC drugs.	A/C	SH	Y	Small group discussion	Skill station		Psychiatry	
Community Medicine									
CM15.1	Define and describe the concept of mental Health	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Psychiatry	
CM15.2	Describe warning signals of mental health disorder	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Psychiatry	
CM15.3	Describe National Mental Health program	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Psychiatry	
Forensic Medicine & Toxicology									

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
FM3.17	Describe and discuss the sexual perversions fetichism, transvestism, voyeurism, sadism, necrophagia, masochism, exhibitionism, frotteurism, Necrophilia	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology, Psychiatry	
FM5.1	Classify common mental illnesses including post-traumatic stress disorder (PTSD)	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		Psychiatry	
FM5.2	Define, classify and describe delusions, hallucinations, illusion, lucid interval and obsessions with exemplification	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		Psychiatry	
FM5.3	Describe civil and criminal responsibilities of a mentally ill person	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		Psychiatry	
FM5.4	Differentiate between true insanity from feigned insanity	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		Psychiatry	
FM5.5	Describe & discuss Delirium tremens	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		Psychiatry, General Medicine	
FM5.6	Describe the Indian Mental Health Act, 1987 with special reference to admission, care and discharge of a mentally ill person	K	K/KH	N	Lecture, Small group discussion	Written/ Viva voce		Psychiatry	
General Medicine									
IM17.14	Counsel patients with migraine and tension headache on lifestyle changes and need for prophylactic therapy	A/C	SH	N	DOAP session	Skill Assessment		Pharmacology	Psychiatry
IM21.8	Enumerate the indications for psychiatric consultation and describe the precautions to be taken in a patient with suspected suicidal ideation / gesture	K	KH	Y	DOAP session	Skill assessment		Forensic Medicine, Psychiatry	
IM24.2	Perform multidimensional geriatric assessment that includes medical, psycho-social and functional components	S	SH	Y	Bedside clinic, DOAP session	Skill assessment		Psychiatry	
IM24.5	Describe and discuss the aetiopathogenesis,clinical presentation, identification, functional changes, acute care, stabilization, management and rehabilitation of depression in the elderly	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Psychiatry

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
IM24.7	Describe and discuss the aetiopathogenesis,clinical presentation, identification, functional changes, acute care, stabilization, management and rehabilitation of personality changes in the elderly	K	KH	N	Lecture, Small group discussion	Written/ Viva voce			Psychiatry
IM24.19	Enumerate and describe the social problems in the elderly including isolation, abuse, change in family structure and their impact on health	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Psychiatry
Pediatrics									
PE1.2	Discuss and describe the patterns of growth in infants, children and Adolescents	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Psychiatry
PE1.3	Discuss and describe the methods of assessment of growth including use of WHO and Indian national standards. Enumerate the parameters used for assessment of physical growth in infants, children and adolescents	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Psychiatry
PE1.5	Define development and discuss the normal developmental milestones with respect to motor, behaviour, social, adaptive and language	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Psychiatry
PE5.4	Describe the clinical features, diagnosis and management of Breath Holding spells	K	K	N	Lecture, Small group discussion	Written/ Viva voce			Psychiatry
PE5.5	Describe the clinical features, diagnosis and management of Temper tantrums	K	K	N	Lecture, Small group discussion	Written/ Viva voce			Psychiatry
PE5.7	Describe the clinical features, diagnosis and management of Fussy infant	K	K	N	Lecture, Small group discussion	Written			Psychiatry
PE5.10	Discuss the role of child guidance clinic in children with Behavioral problems and the referral criteria	K	K	N	Lecture, Small group discussion	Written/ Viva voce			Psychiatry
PE6.2	Describe the physical , physiological and psychological changes during Adolescence (Puberty)	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Psychiatry

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
PE6.4	Describe Adolescent sexuality and common problems related to it	K	KH	N	Lecture, Small group discussion	Written/ Viva voce			Psychiatry
PE6.5	Explain Adolescent Nutrition and common nutritional problems	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Psychiatry
PE6.6	Discuss the common Adolescent Eaing disorders (Anorexia Nervosa, Biulimia)	K	KH	N	Lecture, Small group discussion	Written/ Viva voce			Psychiatry
PE6.7	Describe the common mental health problems during Adolescence	K	KH	Y	Lecture, Small Group discussion	Written/ Viva voce			Psychiatry
PE6.13	Enumerate the prevalence and the importance of recognition of sexual drug abuse in adolescents and children	K	K	N	Lecture, Small group discussion	Written/ Viva voce			Psychaitry
Physical Medicine & Rehabilitation									
PM 9.1	Describe rehabilative aspects as they pertain to the elderly including patients with dementia, depression, incontinence immobility and nutritional needs	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			General Medicine, Psychiatry
Dermatology, Venereology & Leprosy									
DR9.7	Enumerate and describe the complications of leprosy and its management, including understanding disability and stigma	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		General Medicine	Pharmacology, Psychiatry
Forensic Medicine & Toxicology									
FM2.5	Discuss moment of death, modes of death- coma, asphyxia and syncope	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Psychiatry	Pathology
FM3.14	SEXUAL OFFENCES Describe and discuss the examination of the victim of an alleged case of rape, and the preparation of report, framing the opinion and preservation and despatch of trace evidences in such cases	K	K/KH	Y	Lecture, Small group discussion, Bedside clinic, DOAP session	Written/ Viva voce / OSCE		Obstetrics & Gynaecology, Psychiatry	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
FM3.15	SEXUAL OFFENCES Describe and discuss examination of accused and victim of sodomy, preparation of report, framing of opinion, preservation and despatch of trace evidences in such cases	K	K/KH	Y	Lecture, Small group discussion, Bedside clinic, DOAP session	Written/ Viva voce / OSCE		Obstetrics & Gynaecology, Psychiatry	
FM3.16	SEXUAL OFFENCES Describe and discuss adultery and unnatural sexual offences- sodomy, incest, lesbianism, buccal coitus, bestiality, indecent assault and preparation of report, framing the opinion and preservation and despatch of trace evidences in such cases	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology, Psychiatry	

DERMATOLOGY, VENEROLOGY AND LEPROSY (CODE: DR)

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
DERMATOLOGY, VENEREOLOGY & LEPROSY									
Topic: Acne		**Number of competencies:(03)**			**Number of procedures that require certificaion:(NIL)**				
DR1.1	Enumerate the causative and risk factors of acne	K	K	Y	Lecture, Small group discussion	Written/ Viva voce			
DR1.2	Identify and grade the various common types of acne	S	SH	Y	Bedside clinic	Skill assessment			
DR1.3	Describe the treatment and preventive measures for various kinds of acne	K	K	Y	Lecture, Small group discussion	Written/ Viva voce			
Topic: Vitiligo		**Number of competencies: (02)**			**Number of procedures that require certificaion:(NIL)**				
DR2.1	Identify and differentiate vitiligo from other causes of hypopigmented lesions	S	S	Y	Bedside clinic	Skill assessment			
DR2.2	Describe the treatment of vitiligo	K	K	Y	Lecture, Small group discussion	Written/ Viva voce			
Topic: Papulosquamous disorders		**Number of competencies:(03)**			**Number of procedures that require certificaion:(NIL)**				
DR3.1	Identify and distinguish psoriatic lesions from other causes	K	SH	Y	Bedside clinic	Skill assessment/ Written/ Viva voce			
DR3.2	Demonstrate the grattage test	S	SH	Y	Bedside clinic	Skill assessment			
DR3.3	Enumerate the indications for and describe the various modalities of treatment of psoriasis including topical, systemic and phototherapy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
Topic: Lichen Planus		**Number of competencies:(02)**			**Number of procedures that require certificaion:(NIL)**				
DR4.1	Identify and distinguish lichen planus lesions from other causes	S	SH	Y	Bedside clinic	Skill assessment			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
DR4.2	Enumerate and describe the treatment modalities for lichen planus	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
Topic: Scabies		**Number of competencies:(03)**				**Number of procedures that require certificaion:(NIL)**			
DR5.1	Describe the etiology, microbiology, pathogenesis, natural history, clinical features, presentations and complications of scabies in adults and children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	
DR5.2	Identify and differentiate scabies from other lesions in adults and children	S	SH	Y	Bedside clinic	Skill assessment		Pediatrics	
DR5.3	Enumerate and describe the pharmacology, administration and adverse reaction of pharmacotherapies for scabies	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	Pharmacology
Topic: Pediculosis		**Number of competencies : (02)**				**Number of procedures that require certificaion:(NIL)**			
DR6.1	Describe the etiology pathogenesis and diagnostic features of pediculosis in adults and children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	Microbiology
DR6.2	Identify and differentiate pediculosis from other skin lesions in adults and children	S	SH	Y	Bedside clinic	Skill assessment		Pediatrics	
Topic: Fungal Infections		**Number of competencies: (03)**				**Number of procedures that require certificaion:(NIL)**			
DR7.1	Describe the etiology, microbiology, pathogenesis and clinical presentations and diagnostic features of dermatophytes in adults and children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	Microbiology
DR7.2	Identify Candida species in fungal scrapings and KOH mount	S	SH	Y	DOAP session	Skill assessment			Microbiology
DR7.3	Describe the pharmacology and action of antifungal (systemic and topical) agents. Enumerate side effects of antifungal therapy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Microbiology, Pharmacology
Topic: Viral infections		**Number of competencies (07)**				**Number of procedures that require certification: (NIL)**			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
DR8.1	Describe the etiology, microbiology, pathogenesis and clinical presentations and diagnostic features of common viral infections of the skin in adults and children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	Microbiology
DR8.2	Identify and distinguish herpes simplex and herpes labialis from other skin lesions	S	SH	Y	DOAP session	Skill assessment			
DR8.3	Identify and distinguish herpes zoster and varicella from other skin lesions	S	SH	Y	DOAP session	Skill assessment			
DR8.4	Identify and distinguish viral warts from other skin lesions	S	SH	Y	DOAP session	Skill assessment			
DR8.5	Identify and distinguish molluscum contagiosum from other skin lesions	S	SH	Y	DOAP session	Skill assessment			
DR8.6	Enumerate the indications, describe the procedure and perform a Tzanck smear	S	SH	Y	DOAP session	Skill assessment			
DR8.7	Enumerate the indications and describe the pharmacology, administration and adverse reaction of pharmacotherapies for common viral illnesses of the skin	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Pharmacology
Topic: Leprosy		**Number of competencies: (07)**				**Number of procedures that require certificaion:(NIL)**			
DR9.1	Classify, describe the epidemiology, etiology, microbiology, pathogenesis, clinical presentations and diagnostic features of Leprosy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology, Community Medicine
DR9.2	Demonstrate (and classify based on) the clinical features of leprosy including an appropriate neurologic examination	S	SH	Y	Bedside clinic	Bedside clinic/ Skill assessment		General Medicine	
DR9.3	Enumerate the indications and observe the performance of a slit skin smear in patients with leprosy	S	KH	Y	Bedside clinic, DOAP session	Written/ Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
DR9.4	Enumerate, describe and identify lepra reactions and supportive measures and therapy of lepra reactions	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Pharmacology
DR9.5	Enumerate the indications and describe the pharmacology, administration and adverse reaction of pharmacotherapies for various classes of leprosy based on national guidelines	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Pharmacology, Community Medicine
DR9.6	Describe the treatment of Leprosy based on the WHO guidelines	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Pharmacology, Community Medicine
DR9.7	Enumerate and describe the complications of leprosy and its management, including understanding disability and stigma.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Pharmacology, Psychiatry
Topic: Sexually Transmitted Diseases		**Number of competencies: (11)**			**Number of procedures that require certificaion:(NIL)**				
DR10.1	Identify and classify syphilis based on the presentation and clinical manifestations	S	SH	Y	Bedside clinic	Skill assessment		General Medicine	Microbiology
DR10.2	Identify spirochete in a dark ground microscopy	S	SH	Y	DOAP session	Skill assessment			Microbiology
DR10.3	Enumerate the indications and describe the pharmacology, administration and adverse reaction of pharmacotherapies for syphilis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Pharmacology, Microbiology
DR10.4	Describe the prevention of congenital syphilis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
DR10.5	Counsel in a non-judgemental and empathetic manner patients on prevention of sexually transmitted disease	C	SH	Y	DOAP session	Skill assessment		General Medicine	
DR10.6	Describe the etiology, diagnostic and clinical features of non-syphilitic sexually transmitted diseases (chancroid, donovanosis and LGV)	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
DR10.7	Identify and differentiate based on the clinical features non-syphilitic sexually transmitted diseases (chancroid, donovanosis and LGV)	S	SH	Y	Bedside clinic	Skill assessment		General Medicine	Microbiology
DR10.8	Enumerate the indications and describe the pharmacology, indications and adverse reactions of drugs used in the non-syphilitic sexually transmitted diseases (chancroid, donovanosis and LGV)	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Pharmacology, Microbiology
DR10.9	Describe the syndromic approach to ulcerative sexually transmitted disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
DR10.10	Describe the etiology, diagnostic and clinical features and management of gonococcal and non-gonococcal urethritis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
DR10.11	Describe the etiology, diagnostic and clinical features and management of vaginal discharge	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology	
Topic: HIV		**Number of competencies: (03)**				**Number of procedures that require certificaion:(NIL)**			
DR11.1	Describe the etiology, pathogenesis and clinical features of the dermatologic manifestations of HIV and its complications including opportunistic infections	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Microbiology
DR11.2	Identify and distinguish the dermatologic manifestations of HIV, its complications, opportunistic infections and adverse reactions	S	SH	Y	Bedside clinic	Skill assessment		General Medicine	Microbiology
DR11.3	Enumerate the indications and describe the pharmacology, administration and adverse reaction of pharmacotherapies for dermatologic lesions in HIV	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Pharmacology, Microbiology
Topic: Dermatitis and Eczema		**Number of competencies: (07)**				**Number of procedures that require certificaion:(NIL)**			
DR12.1	Describe the aetiopathogenesis of eczema	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
DR12.2	Identify eczema and differentiate it from lichenification and changes of aging	S	SH	Y	Bedside clinic	Skill assessment			
DR12.3	Classify and grade eczema	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
DR12.4	Enumerate the indications and describe the pharmacology, indications and adverse reactions of drugs used in the treatment of eczema	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
DR12.5	Define erythroderma. Enumerate and identify the causes of erythroderma. Discuss the treatment	S	KH	Y	Bedside clinic	Written/ Skill assessment			
DR12.6	Identify and distinguish exfoliative dermatitis from other skin lesions	S	SH	Y	Bedside clinic	Skill assessment			
DR12.7	Identify and distinguish fixed drug eruptions and Steven Johnson syndrome from other skin lesions	S	SH	Y	Bedside clinic	Skill assessment		General Medicine	Pathology, Microbiology
Topic: Vesicubullous Lesions		**Number of competencies:(03)**			**Number of procedures that require certificaion:(NIL)**				
DR13.1	Distinguish bulla from vesicles	S	SH	Y	Bedside clinic	Skill assessment			
DR13.2	Demonstrate the Tzanck test, nikolsky sign and bulla spread sign	S	SH	Y	Bedside clinic	Skill assessment			
DR13.3	Calculate the body surface area of involvement of vesiculobullous lesions	S	SH	Y	Bedside clinic	Skill assessment			
Topic: Urticaria Angioedema		**Number of competencies: (05)**			**Number of procedures that require certificaion:(NIL)**				
DR14.1	Describe the etiology, pathogenesis and clinical precipitating features and classification of Urticaria and angioedema	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Microbiology, Pathology

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
DR14.2	Identify and distinguish urticarial from other skin lesions	S	SH	Y	Bedside clinic	Skill assessment			
DR14.3	Demonstrate dermographism	S	SH	Y	Bedside clinic	Skill assessment			
DR14.4	Identify and distinguish angioedema from other skin lesions	S	SH	Y	Bedside clinic	Skill assessment			
DR14.5	Enumerate the indications and describe the pharmacology indications and adverse reactions of drugs used in the urticaria and angioedema	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Pharmacology
Topic: Pyoderma		**Number of competencies: (04)**				**Number of procedures that require certificaion:(NIL)**			
DR15.1	Identify and distinguish folliculitis impetigo and carbuncle from other skin lesions	S	SH	Y	Bedside clinic	Skill assessment			
DR15.2	Identify staphylococcus on a gram stain	S	SH	Y	Bedside clinic	Skill assessment			Microbiology
DR15.3	Enumerate the indications and describe the pharmacology, indications and adverse reactions of topical and systemic drugs used in treatment of pyoderma	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	Microbiology, Pharmacology
DR15.4	Enumerate the indications for surgical referral	S	KH	Y	DOAP session	Written/ Viva voce		General Surgery	
Topic: Collagen Vascular disease		**Number of competencies: (02)**				**Number of procedures that require certificaion:(NIL)**			
See also major competencies listed in General Medicine									
DR16.1	Identify and distinguish skin lesions of SLE	S	SH	Y	Bedside clinic	Skill assessment		General Medicine	Pathology

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
DR16.2	Identify and distinguish Raynaud's phenomenon	S	SH	Y	Bedside clinic	Skill assessment		General Medicine	Pathology
Topic: Nutritional Deficiencies and Skin		**Number of competencies: (04)**				**Number of procedures that require certificaion:(NIL)**			
DR17.1	Enumerate and identify the cutaneous findings in vitamin A deficiency	K/S	SH	Y	Lecture, Small group discussion, Bedside clinic	Skill assessment/ Viva voce		General Medicine, Pediatrics, Biochemistry	
DR17.2	Enumerate and describe the various skin changes in Vitamin B complex deficiency	K	KH	Y	Lecture	Written/ Viva voce		General Medicine, Pediatrics, Biochemistry	
DR17.3	Enumerate and describe the various changes in Vitamin C deficiency	K	KH	Y	Lecture	Written/ Viva voce		General Medicine, Pediatrics, Biochemistry	
DR17.4	Enumerate and describe the various changes in Zinc deficiency	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Pediatrics, Biochemistry	
Topic: Systemic diseases and the skin		**Number of competencies:(02)**				**Number of procedures that require certification:(NIL)**			
DR18.1	Enumerate the cutaneous features of Type 2 diabetes	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
DR18.2	Enumerate the cutaneous features of hypo/hyper-thyroidism	K	K	Y	Lecture, Small group	Written/ Viva voce		General Medicine	

Column C: K- Knowledge, S – Skill, A - Attitude / professionalism, C- Communication.
Column D: K – Knows, KH - Knows How, SH - Shows how, P- performs independently,
Column F: DOAP session – Demonstrate, Observe, Assess, Perform.
Column H: If entry is P: indicate how many procedures must be done independently for certification/ graduation

Integration

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
Human Anatomy									
AN4.2	Describe structure & function of skin with its appendages	K	KH	Y	Lecture, DOAP session	Written/ Viva voce		Dermatology, Venereology & Leprosy	
AN4.4	Describe modifications of deep fascia with its functions	K	KH	Y	Lecture, DOAP session	Written/ Viva voce		Dermatology, Venereology & Leprosy	
AN4.5	Explain principles of skin incisions	K	KH	N	Lecture	Written		Dermatology, Venereology & Leprosy	
Pathology									
PA34.1	Describe the risk factors, pathogenesis, pathology and natural history of squamous cell carcinoma of the skin	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Dermatology, Venereology & Leprosy	
PA34.2	Describe the risk factors, pathogenesis, pathology and natural history of basal cell carcinoma of the skin	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Dermatology, Venereology & Leprosy	
PA34.3	Describe the distinguishing features between a nevus and melanoma. Describe the etiology, pathogenesis, risk factors, morphology, clinical features and metastases of melanoma	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Dermatology, Venereology & Leprosy	
PA34.4	Identify, distinguish and describe common tumors of the skin	S	SH	N	DOAP session	Skill Assessment		Dermatology, Venereology & Leprosy	
Microbiology									

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
MI4.3	Describe the etio-pathogenesis of Skin and soft tissue infections and discuss the clinical course, and the laboratory diagnosis.	K	KH	Y	Lecture	Written/ Viva voce		Dermatology, Venereology & Leprosy, General Surgery	
MI7.2	Describe the etio-pathogenesis and discuss the laboratory diagnosis of sexually transmitted infections. Recommend preventive measures, wherever relevant.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Dermatology, Venereology & Leprosy, Obstetrics & Gynaecology	
				Pharmacology					
PH1.46	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of antileprotic drugs	K	KH	Y	Lecture	Written/ Viva voce		Dermatology, Venereology & Leprosy	Microbiology
PH1.57	Describe drugs used in skin disorders	K	KH	Y	Lecture	Written/ Viva voce		Dermatology, Venereology & Leprosy	
				Pediatrics					
PE31.4	Identify Atopic dermatitis and manage	S	SH		Bedside clinics, Skill Lab	Skill Assessment		Dermatology, Venereology & Leprosy	

PHYSICAL MEDICINE & REHABILITATION (CODE: PM)

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PHYSICAL MEDICINE & REHABILITATION									
Topic: Introduction to Physical Medicine		**Number of competencies: (04)**				**Number of procedures that require certification:(NIL)**			
PM1.1	Define and describe the scope of physical Medicine and Rehabilitation and functional restoration	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
PM1.2	Define and describe disability, its cause, and magnitude, identification and prevention of disability	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			General Medicine, Orthopedics
PM1.3	Define and describe the methods to identify and prevent disability	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			General Medicine, Orthopedics
PM1.4	Enumerate the rights and entitlements of differently abled persons	K	K	Y	Lecture, Small group discussion	Written/ Viva voce			General Medicine, Orthopedics
Topic: Cerebrovascular accident		**Number of competencies: (04)**				**Number of procedures that require certification:(NIL)**			
PM2.1	Describe the causes of disability in the patient with a cerebrovascular accident	K	KH	Y	Lecture, small group discussion	Written/ Viva voce		Human Anatomy	General Medicine
PM2.2	Describe and discuss the treatment of rigidity and spasticity	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			General Medicine
PM2.3	Describe and disucss the principles of early mobilizations, mobility aids and splints	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			General Medicine
PM2.4	Describe and discuss the impact of co-morbidities on the rehabilitation of the patient with cerebrovascular accident	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			General Medicine
Topic: Cerebral Palsy		**Number ocompetencies: (07)**				**Number of procedures that require certification: (NIL)**			
PM3.1	Describe and discuss the clinical features, types, evaluation, diagnosis and management of cerebral palsy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy	Pediatrics

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PM3.2	Recognize, Describe and discuss the spectrum of multiple disability: cognitive, motor, visual and hearing in cerebral palsy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Pediatrics
PM3.3	Recognize describe and discuss the role of special education in children with learning disabilities	K	K	Y	Lecture, Small group discussion	Written/ Viva voce			Pediatrics
PM3.4	Demonstrate spasticity rigidity and dystonia in children with cerebral palsy	S	SH	Y	DOAP session, Small group discussion, Bedside clinic	Skill assessment			Pediatrics
PM3.5	Enumerate the indications and describe the therapies for spasticity including medications, serial casts, nerve blocks, botulinum toxin injections	K	KH	Y	Lecture, Small group discussion			Pharmacology	Pediatrics, Orthopedics
PM3.6	Enumerate the indications and describe prevention of joint subluxations and contractures by proper positioning, and use of special chairs, and appliances	K	KH	Y	DOAP session, Small group discussion, Bedside clinic				Pediatrics
PM3.7	Enumerate the first aid measures to be used in patients with seizures	K	K	Y	Lecture, Small group discussion	Written/ Viva voce			Pediatrics
Topic: Musculoskeletal system		**Number of competencies : (05)**				**Number of procedures that require certification: (NIL)**			
PM4.1	Describe the common patterns, clinical features, investigations, diagnosis and treatment of common causes of arthritis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			General Medicine, Orthopedics
PM4.2	Describe and discuss the principles of management of chronic pain and role of common modalities (moist heat, ultrasound, Short wave diathermy)	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Pediatrics
PM4.3	Observe in a mannequin or equivalent the administration of an intra-articular injection	S	KH	N	DOAP session	Skill assessment			Orthopedics
PM4.4	Describe the role of exercise as a therapeutic modality	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PM4.5	Demonstrate correct assessment of muscle strength and range of movements	S	SH	Y	DOAP session, Bedside clinic	Skill assessment			General Medicine, Orthopedics
Topic: Amputation		**Number of competencies : (04)**			**Number of procedures that require certification: (NIL)**				
PM5.1	Enumerate the indications and describe the principles of amputation	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Orthopedics, General Surgery
PM5.2	Describe the principles of early mobilization, evaluation of the residual limb, contralateral limb and the influence of co-morbidities	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Orthopedics
PM5.3	Demonstrate the correct use of crutches in ambulation and postures to correct contractures and deformities	S	SH	Y	DOAP session, Bedside clinic	Skill assessment			Orthopedics
PM5.4	Identify the correct prosthesis for common amputations	S	SH	Y	DOAP session	Skill assessment written			Orthopedics
Topic: Lower motor neruon lesion		**Number of competencies :(04)**			**Number of procedures that require certification: (NIL)**				
PM6.1	Perform and demonstrate a clinical examination of sensory and motor deficits of peripheral nerve	S	SH	Y	Bedside clinic	Skill assessment			General Medicine
PM6.2	Enumerate the indications and describe the principles of nerve conduction velocity and EMG	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			General Medicine
PM6.3	Describe the principles principles of skin traction, serial casts and surgical treatment including contracture release, tendon transfer, osteotomies and arthrodesis.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Orthopedics
PM6.4	Describe the principles of orthosis for ambulation in PPRP	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Orthopedics
Topic: Spinal injury		**Number of competencies:(09)**			**Number of procedures that require certification: (NIL)**				

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PM7.1	Describe and discuss the clinical features, diagnostic work up and management of spinal cord injury	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Orthopedics
PM7.2	Describe and demonstrate process of transfer, application of collar restraints while maintaining airway and prevention of secondary injury in a mannequin/model	S	SH	Y	DOAP session, Small group discussion, Bedside clinic	Skill assessment			Orthopedics
PM7.3	Perform and demonstrate a correct neurological examination in a patient with spinal injury and determine the neurologic level of injury	S	SH	Y	Bed side clinic	Skill assessment			Orthopedics
PM7.4	Assess bowel and bladder function and identify common patterns of bladder dysfunction	S	KH	Y	Small group discussion	Written/ Viva voce			General Medicine, Orthopedics
PM7.5	Enumerate the indications and identify the common mobility aids and appliances, wheel chairs	S	S	Y	DOAP session	Skill assessment /Viva voce			Orthopedics
PM7.6	Enumerate the indications and describe the pharmacology and side effects of commonly used drugs in neuropathic bladder	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	General Medicine
PM7.7	Enumerate and describe common life threatening complications following SCI like Deep vein Thrombosis, Aspiration Pneumonia, Autonomic dysreflexia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			General Medicine, Orthopedics
PM7.8	Enumerate the causes of, describe and classify Pressure Sores,their prevention, and treatment.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			General Surgery
PM7.9	Enumerate the indications of debridement, and Split thickness skin grafting.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			General Surgery
Topic: Traumatic brain injury (TBI)		**Number of competencies:(05)**			**Number of procedures that require certification: (NIL)**				

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PM8.1	Describe the clinical features, evaluation, diagnosis and management of disability following traumatic brain injury	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			General Medicine, Orthopedics, General Surgery
PM8.2	Describe and discuss cognitive dysfunction like deficits in attention, memory and communication.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			General Medicine
PM8.3	Describe and discuss common behavior and mood changes following TBI.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			General Medicine
PM8.4	Describe metabolic co-morbidities like SIADH, diabetes mellitus, insipidus and endocrine dysfunction following TBI	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			General Medicine
PM8.5	Describe the vocational opportunities and community based rehabilitation following TBI	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			General Medicine
Topic: Geriatrics		**Number of competencies:(01)**				**Number of procedures that require certification: (NIL)**			
PM 9.1	Describe rehabilitative aspects as they pertain to the elderly including patients with dementia, depression, incontinence immobility and nutritional needs	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			General Medicine, Psychiatry
	Column C: K- Knowledge, S – Skill, A - Attitude / professionalism, C- Communication. **Column D: K – Knows, KH - Knows How, SH - Shows how, P- performs independently,** **Column F: DOAP session – Demonstrate, Observe, Assess, Perform.** **Column H: If entry is P: indicate how many procedures must be done independently for certification/ graduation**								

Integration

				General Medicine					
IM18.16	Enumerate the indications, describe and observe the multidisciplinary rehabilitation of patients with a CVA	S	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Physical Medicine & Rehabilitation
IM24.13	Describe and discuss the aetiopathogenesis,clinical presentation, identification, functional changes, acute care, stabilization, management and rehabilitation of falls in the elderly	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Orthopedics, Physical Medicine & Rehabilitation

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
IM24.16	Describe and discuss the principles of physical and social rehabilitation, functional assessment, role of physiotherapy and occupational therapy in the management of disability in the elderly	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Orthopedics, Physical Medicine & Rehabilitation
				Pediatrics					
PE3.8	Discuss the etio-pathogenesis, clinical presentation and multi-disciplinary approach in the management of Cerebral palsy	K	KH	Y	Lecture, Small group discussion, Bed side clinics	Written/ Viva voce			Physical Medicine & Rehabilitation

List of contributing subject Experts

1. Human Anatomy

- Dr. Praveen R Singh, Professor & Head, Department of Anatomy, Pramukhswami Medical College, Karamsad, Gujarat
- Dr. Nachiket Shankar, Associate Professor, Department of Anatomy, St. John's Medical College & Hospital, Bangalore

2. Physiology

- Dr. Mario Vaz, Professor, Department of Physiology, St. John's Medical College & Hospital, Bangalore
- Dr. Jayashree Sengupta, Former Professor & Head, Department of Physiology, All India Institute of Medical Sciences, New Delhi.
- Dr Hasmukh D Shah, Professor & Head, Department of Physiology, Pramukhswami Medical College, Karamsad, Gujarat

3. Biochemistry

- Dr. Nibhriti Das, Professor, Department of Biochemistry, All India Institute of Medical Sciences, New Delhi
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4. Pharmacology

- Dr. S. K. Maulik, Professor, Department of Pharmacology, All India Institute of Medical Sciences, New Delhi
- Dr. Vandana Roy, Professor, Department of Pharmacology, Maulana Azad Medical College, New Delhi

5. Pathology

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6. Microbiology

- Dr. S. Geetalakshmi, Dean, Professor, Department of Microbiology, Stanley Medical College, Chennai, Tamil Nadu.
- Dr. Padma Srikanth, Professor, Department of Microbiology, Sri Ramachandra Medical College & Research Institute, Chennai
- Dr. Suman Singh, Professor, Department of Microbiology, Pramukhswami Medical College, Karamsad, Gujarat

7. Forensic Medicine & Toxicology

- Dr. Sanjeev Lalwani, Professor & Registrar (Academics), Department of Forensic Medicine, All India Institute of Medical Sciences, New Delhi
- Dr. T. D. Dogra, Former Director & Former Head, Department of Forensic Medicine, All India Institute of Medical Sciences, New Delhi; currently, Vice Chancellor, SGT University, Gurugram
- Col. Ravi Rautji, Professor & Head, Department of Forensic Medicine, Commanding Officer, Directorate General of Medical Services (Army), New Delhi
- Dr. S.D. Nanandkar, Professor & Head, Department of Forensic Medicine, Grant Government Medical College & Sir J.J. Group of Hospitals, Mumbai
- Dr. Indrajit L. Khandekar, In-charge CFMU and Associate Professor, Department of Forensic Medicine & Toxicology, MGIMS and Kasturba Hospital, Sewagram, Wardha.
- Dr. S. B. Punpale, Professor & Head, Department of Forensic Medicine, B. J. Medical College, Pune, Maharashtra

8. Community Medicine

- Dr. B. S. Garg, Professor & Head, Department of Community Medicine, Mahatama Gandhi Institute of Medical Sciences, Wardha, Sewagram, Maharashtra
- Dr. Umesh Kapil, Professor, Department of Community Medicine, All India Institute of Medical Sciences, New Delhi
- Dr. Sanjay Zodpey, Director, Public Health Foundation of India, Isid Campus, 4 Institutional Area, Vasant Kunj, New Delhi
- Dr. Saudan Singh, Professor, Department of Community Medicine, Vardhman Mahavir Medical College & Safdarjung Hospital, New Delhi
- Dr. Dinesh Kumar, Professor, Department of Community Medicine, Pramukhswami Medical College, Karamsad, Gujarat
- Dr. Pankaj B. Shah, Professor, Deartment of Community Medicine, Sri Ramachandra Medical College & Research Institute, Chennai.

9. General Medicine & Respiratory Medicine

- Dr. Krishna G. Seshadri, Visiting Professor, Endocrinology & Metabolism, Balaji Vidyapeeth, Puducherry
- Dr. M. K. Bhatnagar, Director Professor, Department of General Medicine, Lady Hardinge Medical College, New Delhi
- Dr. Aparna Agarwal, Director Professor of Medicine, Lady Hardinge Medical College, New Delhi
- Dr. Anil Gurtoo, Director Professor of Medicine, Lady Hardinge Medical College, New Delhi

10. Pediatrics

- Dr. Harish Chellani, Professor of Pediatrics, Vardhman Mahavir Medical College & Safdarjung Hospital, New Delhi
- Dr. A. K. Dutta, Former Head, Kalawati Saran Children's Hospital, New Delhi

- Dr. S. Aneja, Director Professor & Head, Department of Pediatrics, Kalawati Saran Children's Hospital, New Delhi
- Dr. Latha Ravichandran, Professor, Deartment of Paediatrics, Sri Ramachandra Medical College & Research Institute, Chennai.

11. Psychiatry

- Dr. Rakesh Kumar Chadda, Department of Psychiatry, All India Institute of Medical Sciences, New Delhi
- Dr. N. M. Patil, Professor, Department of Psychiatry, Jawaharlal Nehru Medical College, Belagavi
- Dr. Rajesh Rastogi, Consultant & Head Department of Psychiatry, Vardhman Mahavir Medical College & Safdarjung Hospital, New Delhi.
- Dr. Jagdish R Varma, Associate Professor, Department of Psychiatry, Pramukhswami Medical College, Karamsad, Gujarat

12. Dermatology, Venereology & Leprosy

- Dr. R. K. Gautam, Professor, Department of Dermatology, Venereology & Leprosy, Dr. Ram Manohar Lohia Hospital, New Delhi.
- Dr. Sujay Khandpur, Professor, Department of Dermatology, Venereology & Leprosy, All India Institute of Medical Sciences, New Delhi
- Dr. S. Murugan, Associate Professor of Dermatology, Sri Ramachandra Medical College & Research Institute, Chennai

13. Physical Medicine and Rehabilitation

- Dr. Sanjay Wadhwa, Professor, Department of Physical Medicine & Rehabilitation, All India Institute of Medical Sciences, New Delhi
- Dr. George Tharion, Head, Department of Physical Medicine & Rehabilitation, Christian Medical College, Vellore, Tamil Nadu

- Dr. Jagdish Menon, Professor & Head, Department of Orthopaedics and Dept. of Physical & Rehabilitative Medicine, Jawaharlal Institute of Postgraduate Medical Education and Research, Pondicherry

14. General Surgery

- Dr. N Ananthakrishnan, 2A Vairam Enclave, Siddhananda Nagar, Pondicherry -605005.
- Dr. P. V. Chalam, Former Professor, Department of Surgery, Gandhi Medical College, Secunderabad, Telengana.
- Dr. Dinesh Bhatnagar, Professor, Department of General Surgery, North Delhi Municipal Corporation Medical College, Hindu Rao Hospital, Malka Ganj, Delhi

15. Ophthalmology

- Dr. Smita Singh, Professor, Department of Ophthalmology, Mahatma Gandhi Institute of Medical Sciences, Wardha

16. Oto-rhino-laryngology

- Dr. Achal Gulati, Director Professor, Department of ENT, Maulana Azad Medical College, New Delhi
- Dr. Ravi Kumar, Professor & Head, Department of ENT, Sri Ramachandra Medical College & Research Institute, Chennai
- Dr. Suma Mathew, Professor, Department of ENT, Christian Medical College, Vellore, Tamil Nadu

17. Obstetrics and Gynaecology

- Dr. Neerja Bhatla, Professor, Department of Obstetrics & Gynecology, All India Institute of Medical Sciences, New Delhi
- Dr. Annie Regi, Professor & Head, Department of Obstetrics & Gynecology, Christian Medical College, Vellore, Tamil Nadu
- Dr. Usha Vishwanath, Professor, Department of Obstetrics & Gynecology, Sri Ramachandra Medical College & Research Institute, Chennai

18. Orthopaedics

- Dr. P.V. Vijayaraghavan, Vice Chancellor & Professor of Orthopedics, Sri Ramachandra Medical College & Research Institute, Chennai
- Dr. Raj Bahadur, Professor & Head, Department of Orthopaedics, Postgraduate Institute of Medical Sciences, Chandigarh
- Dr. SC. Goel, Professor, Department of Orthopaedics, Institute of Medical Sciences, BHU, Varanasi, Uttar Pradesh

19. Anaesthesiology

- Dr. Baljit Singh, Director Professor of Anaesthesia, G. B. Pant Hospital, Delhi
- Dr. Ramesh Keshav, Department of Anaesthesia, Dr. Ram Manohar Lohia Hospital, New Delhi
- Dr. Mridula Pawar, Consultant & Head, Department of Anaesthesia, Vardhman Mahavir Medical College & Safdarjung Hospital, New Delhi

20. Radio- Diagnosis

- Dr. Kishor Taori (late), Professor & Head, Department of Radiodiagnosis, Government Medical College, Nagpur

21. Radiotherapy

- Dr. P. K. Jhulka, Dean & Professor of Radiotherapy, All India Institute of Medical Sciences, New Delhi.
- Dr. Shyam Shrivastava, Head, Department of Radiation, Tata Memorial Hospital, Mumbai

22. Dentistry

- Dr. Sridevi Padmanabhan, Professor, Department of Orthodontics, Faculty of Dental Sciences, Sri Ramchandra Medical College & Research Institute, Chennai

MEDICAL COUNCIL OF INDIA

COMPETENCY BASED UNDERGRADUATE CURRICULUM FOR THE INDIAN MEDICAL GRADUATE

Knows → Knows how → Shows → Shows how → Performs

Enumerate | Describe | Observe | Demonstrate | Assist

Counsel | Analyse | Guide | Correlate | Critique

Prescribe | Integrate | Communicate | Interpret | Collaborate

Clinician | Communicator | Team Leader | Professional | Lifelong Learner

Knowledge | Skills | Attitude | Values | Responsiveness | Communication

VOLUME-III (2018)

COMPETENCY BASED UNDERGRADUATE CURRICULUM FOR THE INDIAN MEDICAL GRADUATE

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भारतीय आयुर्विज्ञान परिषद के अधिक्रमण में शासी बोर्ड

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IN SUPERSESSION OF MEDICAL COUNCIL OF INDIA

FOREWORD

The Medical Council of India, aware of its responsibilities in creation of trained health manpower, has been engaged for the past few years in updating the medical curriculum for undergraduates and postgraduates to be in consonance with the changing health needs of the country. The task of updating and reorganization of the postgraduate curriculum in nearly 50 broad specialty disciplines to the competency pattern was accomplished by the Academic Cell of the Council with the help of subject experts and members of its Reconciliation Board and have been uploaded on the Council Website for use of the medical fraternity.

The Council visualized that the Indian Medical Graduate, at the end of the undergraduate training program, should be able to recognize "health for all" as a national goal and should be able to fulfill his/her societal obligations towards the realization of this goal. To fulfill the mandate of the undergraduate medical curriculum which is to produce a clinician, who understands and is able to provide preventive, promotive, curative, palliative and holistic care to his patients, the curriculum must enunciate clearly the competencies the student must be imparted and must have learnt, with clearly defined teaching-learning strategies and effective methods of assessment. The student should be trained to effectively communicate with patients and their relatives in a manner respectful of the patient's preferences, values, beliefs, confidentiality and privacy and to this purpose, a book on Attitude, Ethics & Communication was prepared by the Medical Council of India; the teaching faculty of medical colleges have been receiving training on this module since 2015.

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Competency based Medical Education provides an effective outcome-based strategy where various domains of teaching including teaching learning methods and assessment form the framework of competencies. Keeping this objective as the core ingredient, the Medical Council of India with the help of panel of experts drawn from across the country, laid the basic framework for the revised undergraduate medical curriculum. Over the past four years, a group of highly committed medical professionals working as Members of the MCI Reconciliation Board developed this information into a document incorporating appropriate teaching-learning strategies, tools and techniques of teaching, and modes of assessment which have culminated in the current competency based undergraduate curriculum. We understand that maximum efforts were made to encourage integrated teaching between traditional subject areas using a problem-based learning approach starting with clinical or community cases and exploring the relevance of various preclinical disciplines in both the understanding and resolution of the problem. All efforts have been made to de-emphasize compartmentalisation of disciplines so as to achieve both horizontal and vertical integration in different phases. We are proud of their work accomplishment and congratulate them in the onerous task accomplished.

It gives us great satisfaction to state that the **'competency based undergraduate curriculum'** that has been prepared by the Medical Council of India would definitely serve the cause of medical education and in creating a competent Indian Medical Graduate to serve the community.

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COMPETENCY BASED UNDERGRADUATE CURRICULUM
FOR
THE INDIAN MEDICAL GRADUATE

Preamble

The new Graduate Medical Education Regulations attempts to stand on the shoulder of the contributions and the efforts of resource persons, teachers and students (past and present). It intends to take the learner to provide health care to the evolving needs of the nation and the world.

More than twenty years have passed since the existing Regulations on Graduate Medical Education, 1997 was notified, necessitating a relook at all aspects of the various components in the existing regulations and adapt them to the changing demography, socio-economic context, perceptions, values and expectations of stakeholders. Emerging health care issues particularly in the context of emerging diseases, impact of advances in science and technology and shorter distances on diseases and their management also need consideration. The strong and forward looking fundamentals enshrined in the Regulations on Graduate Medical Education, 1997 has made this job easier. A comparison between the 1997 Regulations and proposed Graduate Medical Education Regulations, 2018 will reveal that the 2018 Regulations have evolved from several key principles enshrined in the 1997 Regulations.

The thrust in the new regulations is continuation and evolution of thought in medical education making it more learner-centric, patient-centric, gender-sensitive, outcome -oriented and environment appropriate. The result is an outcome driven curriculum which conforms to global trends. Emphasis is made on alignment and integration of subjects both horizontally and vertically while respecting the strengths and necessity of subject-based instruction and assessment. This has necessitated a deviation from using “broad competencies”; instead, the reports have written end of phase subject (sub) competencies. These “sub-competencies” can be mapped to the global competencies in the Graduate Medical Education Regulations.

A significant attempt has been made in the outcome driven undergraduate curriculum to provide the orientation and the skills necessary for life-long learning to enable proper care of the patient. In particular, the curriculum provides for early clinical exposure, electives and longitudinal care. Skill acquisition is an indispensable component of the learning process in medicine. The curriculum reinforces this aspect by necessitating certification of certain essential skills. The experts and the writing group have factored in patient availability, access, consent, number of students in a class etc. in suggesting skill acquisition and assessment methods; use of skills labs, simulated and guided environments are encouraged. In the pre-internship years,- the highest level of skill acquisition is a show how (SH) in a simulated or guided environment; few skills require independent performance and certification - these are marked with P (for performance). Opportunity to 'perform' these skills will be available during internship.

The importance of ethical values, responsiveness to the needs of the patient and acquisition of communication skills is underscored by providing dedicated curriculum time in the form of a longitudinal program based on Attitude, Ethics and Communication (AETCOM) competencies. Great emphasis has been placed on collaborative and inter-disciplinary teamwork, professionalism, altruism and respect in professional relationships with due sensitivity to differences in thought, social and economic position and gender.

In addition to the above, an attempt has been made to allow students from diverse educational streams and backgrounds to transition appropriately through a Foundation Course. Dedicated time has been allotted for self directed learning and co-curricular activities.

Formative and internal assessments have been streamlined to achieve the objectives of the curriculum. Minor tweaks to the summative assessment have been made to reflect evolving thought and regulatory requirements. Curricular governance and support have been strengthened, increasing the involvement of Curriculum Committee and Medical Education Departments/Units.

The curriculum document in conjunction with the new Graduate Medical Education Regulations (GMR), when notified, must be seen as a "living document" that should evolve as stakeholder requirements and aspirations change. We hope that the current GMR does just that. The Medical Council of India is

grateful to all the teachers, subject experts, process experts, patients, students and trainees who have contributed through invaluable inputs, intellectual feedbacks and valuable time spent to make this possible. This document would not have been possible without the dedicated and unstinting intellectual, mental and time-consuming efforts of the members of the Reconciliation Board of the Council and the Academic Cell of MCI.

How to use the Manual

This Manual is intended for curriculum planners in an institution to design learning and assessment experiences for the MBBS student. Contents created by subject experts have been curated to provide guidance for the curriculum planners, leaders and teachers in medical schools. They must be used with reference to and in the context of the Regulations.

Section 1

Competencies for the Indian Medical Graduate

Section 1 - provides the global competencies extracted from the Graduate Medical Education Regulations, 2018. The global competencies identified as defining the roles of the **Indian Medical Graduate** are the broad competencies that the learner has to aspire to achieve; teachers and curriculum planners must ensure that the learning experiences are aligned to this Manual.

Extract from the Graduate Medical Education Regulations, 2018

2. Objectives of the Indian Graduate Medical Training Programme

The undergraduate medical education program is designed with a goal to create an "Indian Medical Graduate" (IMG) possessing requisite knowledge, skills, attitudes, values and responsiveness, so that she or he may function appropriately and effectively as a physician of first contact of the community while being globally relevant. To achieve this, the following national and institutional goals for the learner of the Indian Medical Graduate training program are hereby prescribed:-

2.1. National Goals

At the end of undergraduate program, the Indian Medical Graduate should be able to:

(a) recognize “health for all” as a national goal and health right of all citizens and by undergoing training for medical profession fulfill his/her social obligations towards realization of this goal.

(b) learn every aspect of National policies on health and devote herself/himself to its practical implementation.

(c) achieve competence in practice of holistic medicine, encompassing promotive, preventive, curative and rehabilitative aspects of common diseases.

(d) develop scientific temper, acquire educational experience for proficiency in profession and promote healthy living.

(e) become exemplary citizen by observance of medical ethics and fulfilling social and professional obligations, so as to respond to national aspirations.

2.2. Institutional Goals

In consonance with the national goals, each medical institution should evolve institutional goals to define the kind of trained manpower (or professionals) they intend to produce. The Indian Medical Graduates coming out of a medical institute should:

(a) be competent in diagnosis and management of common health problems of the individual and the community, commensurate with his/her position as a member of the health team at the primary, secondary or tertiary levels, using his/her clinical skills based on history, physical examination and relevant investigations.

(b) be competent to practice preventive, promotive, curative and rehabilitative medicine in respect to the commonly encountered health problems.

(c) appreciate rationale for different therapeutic modalities, be familiar with the administration of the "essential drugs" and their common side effects.

(d) be able to appreciate the socio-psychological, cultural, economic and environmental factors affecting health and develop humane attitude towards the patients in discharging one's professional responsibilities.

(e) possess the attitude for continued self learning and to seek further expertise or to pursue research in any chosen area of medicine, action research and documentation skills.

(f) be familiar with the basic factors which are essential for the implementation of the National Health Programs including practical aspects of the following:

(i) Family Welfare and Maternal and Child Health (MCH);

(ii) Sanitation and water supply;

(iii) Prevention and control of communicable and non-communicable diseases;

(iv) Immunization;

(v) Health Education;

(vi) Indian Public Health Standards (IPHS) at various level of service delivery;

(vii) Bio-medical waste disposal; and

(viii) Organizational and or institutional arrangements.

(g) acquire basic management skills in the area of human resources, materials and resource management related to health care delivery, General and hospital management, principal inventory skills and counseling.

(h) be able to identify community health problems and learn to work to resolve these by designing, instituting corrective steps and evaluating outcome of such measures.

(i) be able to work as a leading partner in health care teams and acquire proficiency in communication skills.

(j) be competent to work in a variety of health care settings.

(k) have personal characteristics and attitudes required for professional life including personal integrity, sense of responsibility and dependability and ability to relate to or show concern for other individuals.

All efforts must be made to equip the medical graduate to acquire the skills as detailed in Table 11 Certifiable procedural skills – A Comprehensive list of skills recommended as desirable for Bachelor of Medicine and Bachelor of Surgery (MBBS) – Indian Medical Graduate, as given in the Graduate Medical Education Regulations, 2018

2. 3. Goals for the Learner

In order to fulfil this goal, the Indian Medical Graduate must be able to function in the following roles appropriately and effectively:-

2.3.1. Clinician who understands and provides preventive, promotive, curative, palliative and holistic care with compassion.

2.3.2. Leader and member of the health care team and system with capabilities to collect, analyze, synthesize and communicate health data appropriately.

2.3.3. Communicator with patients, families, colleagues and community.

2.3.4. Lifelong learner committed to continuous improvement of skills and knowledge.

2.3.5. Professional, who is committed to excellence, is ethical, responsive and accountable to patients, community and profession.

3. Competency Based Training Programme of the Indian Medical Graduate

Competency based learning would include designing and implementing medical education curriculum that focuses on the desired and observable ability in real life situations. In order to effectively fulfil the roles as listed in clause 2, the Indian Medical Graduate would have obtained the following set of competencies at the time of graduation:

3.1. Clinician, who understands and provides preventive, promotive, curative, palliative and holistic care with compassion

3.1.1 Demonstrate knowledge of normal human structure, function and development from a molecular, cellular, biologic, clinical, behavioral and social perspective.

3.1.2. Demonstrate knowledge of abnormal human structure, function and development from a molecular, cellular, biological, clinical, behavioural and social perspective.

3.1.3 Demonstrate knowledge of medico-legal, societal, ethical and humanitarian principles that influence health care.

3.1.4 Demonstrate knowledge of national and regional health care policies including the National Health Mission that incorporates National Rural Health Mission (NRHM) and National Urban Health Mission (NUHM), frameworks, economics and systems that influence health promotion, health care delivery, disease prevention, effectiveness, responsiveness, quality and patient safety.

3.1.5. Demonstrate ability to elicit and record from the patient, and other relevant sources including relatives and caregivers, a history that is complete and relevant to disease identification, disease prevention and health promotion.

3.1.6. Demonstrate ability to elicit and record from the patient, and other relevant sources including relatives and caregivers, a history that is contextual to gender, age, vulnerability, social and economic status, patient preferences, beliefs and values.

3.1.7 Demonstrate ability to perform a physical examination that is complete and relevant to disease identification, disease prevention and health promotion.

3.1.8 Demonstrate ability to perform a physical examination that is contextual to gender, social and economic status, patient preferences and values.

3.1.9 Demonstrate effective clinical problem solving, judgment and ability to interpret and integrate available data in order to address patient problems, generate differential diagnoses and develop individualized management plans that include preventive, promotive and therapeutic goals.

3.1.10 Maintain accurate, clear and appropriate record of the patient in conformation with legal and administrative frameworks.

3.1.11 Demonstrate ability to choose the appropriate diagnostic tests and interpret these tests based on scientific validity, cost effectiveness and clinical context.

3.1.12 Demonstrate ability to prescribe and safely administer appropriate therapies including nutritional interventions, pharmacotherapy and interventions based on the principles of rational drug therapy, scientific validity, evidence and cost that conform to established national and regional health programmes and policies for the following:

i) Disease prevention,

ii) Health promotion and cure,

iii) Pain and distress alleviation, and

iv) Rehabilitation and palliation.

3.1.13 Demonstrate ability to provide a continuum of care at the primary and/or secondary level that addresses chronicity, mental and physical disability.

3.1.14 Demonstrate ability to appropriately identify and refer patients who may require specialized or advanced tertiary care.

3.1.15 Demonstrate familiarity with basic, clinical and translational research as it applies to the care of the patient.

3.*2.* ***Leader and member of the health care team and system***

3.2.1 Work effectively and appropriately with colleagues in an inter-professional health care team respecting diversity of roles, responsibilities and competencies of other professionals.

3.2.2 Recognize and function effectively, responsibly and appropriately as a health care team leader in primary and secondary health care settings.

3.2.3 Educate and motivate other members of the team and work in a collaborative and collegial fashion that will help maximize the health care delivery potential of the team.

3.2.4 Access and utilize components of the health care system and health delivery in a manner that is appropriate, cost effective, fair and in compliance with the national health care priorities and policies, as well as be able to collect, analyze and utilize health data.

3.2.5 Participate appropriately and effectively in measures that will advance quality of health care and patient safety within the health care system.

3.2.6 Recognize and advocate health promotion, disease prevention and health care quality improvement through prevention and early recognition: in a) life style diseases and b) cancer, in collaboration with other members of the health care team.

3.3. ***Communicator with patients, families, colleagues and community***

3.3.1 Demonstrate ability to communicate adequately, sensitively, effectively and respectfully with patients in a language that the patient understands and in a manner that will improve patient satisfaction and health care outcomes.

3.3.2 Demonstrate ability to establish professional relationships with patients and families that are positive, understanding, humane, ethical, empathetic, and trustworthy.

3.3.3 Demonstrate ability to communicate with patients in a manner respectful of patient’s preferences, values, prior experience, beliefs, confidentiality and privacy.

3.3.4 Demonstrate ability to communicate with patients, colleagues and families in amanner that encourages participation and shared decision-making.

3.4. Lifelong learner committed to continuous improvement of skills and knowledge

3.4.1. Demonstrate ability to perform an objective self-assessment of knowledge and skills, continue learning, refine existing skills and acquire new skills.

3.4.2. Demonstrate ability to apply newly gained knowledge or skills to the care of the patient.

3.4.3. Demonstrate ability to introspect and utilize experiences, to enhance personal and professional growth and learning.

3.4.4. Demonstrate ability to search (including through electronic means), and critically revaluate the medical literature and apply the information in the care of the patient.

3.4.5. Be able to identify and select an appropriate career pathway that is professionally rewarding and personally fulfilling.

3.5. *Professional who is committed to excellence, is ethical, responsive and accountable to patients, community and the profession*

3.5.1. Practice selflessness, integrity, responsibility, accountability and respect.

3.5.2. Respect and maintain professional boundaries between patients, colleagues and society.

3.5.3. Demonstrate ability to recognize and manage ethical and professional conflicts.

3.5.4. Abide by prescribed ethical and legal codes of conduct and practice.

3.5.5. Demonstrate a commitment to the growth of the medical profession as a whole.

Section 2

Subject-wise outcomes

Section 2 contains subject-wise outcomes so called “sub-competencies” that must be achieved at the end of instruction in that subject. These are organised in tables and have two parts. The core subject outcomes are in first part. The second part in the same document (titled Integration) contains outcomes/competencies in other subjects which have been identified by experts in those subjects as requiring alignment or integration with the core subject.

Outcomes (competencies) in each subject are grouped according to topics number-wise. It is important to review the individual outcomes (competencies) in the light of the topic outcomes as a whole. For each competency outlined - the learning domains (Knowledge, Skill, Attitude, Communication) are identified. The expected level of achievement in that subject is identified as – [knows (K), knows how (KH), shows how (SH), perform (P)]. As a rule, ‘perform’ indicates independent performance without supervision and is required rarely in the pre-internship period. The outcome is a core (Y - must achieve) or a non-core (N - desirable) outcome. Suggested learning and assessment methods (these are suggestions) and explanation of the terms used are given under the section “definitions used in this document”. The suggested number of times a skill must be performed independently for certification in the learner’s log book is also given. Last two columns indicate subjects within the same phase and other phases with which the topic can be taught - together - aligned (temporal coordination), shared, correlated or nested.

The number of topics and competencies in each subject are given below:

Topics & outcomes in Pre-clinical & Para-clinical subjects

Sr. No.	Subjects	Number of topics	Number of outcomes
1.	**Human Anatomy**	82	409
2.	**Physiology**	11	137
3.	**Biochemistry**	11	89
4.	**Pharmacology**	05	85
5.	**Pathology**	36	182
6.	**Microbiology**	08	54
7.	**Forensic Medicine & Toxicology**	14	162
	Total	**167**	**1118**

Topics & outcomes in Medicine and Allied subjects

Sr. No.	Subjects	Number of topics	Number of outcomes
1.	**Community Medicine**	20	107
2.	**General Medicine**	26	506
3.	**Respiratory Medicine**	02	47
4.	**Pediatrics**	35	406
5.	**Psychiatry**	19	117
6.	**Dermatology, Venereology & Leprosy**	18	73
7.	**Physical Medicine & Rehabilitation**	09	43
	Total	**129**	**1299**

Topics & outcomes in Surgery and Allied subjects

Sr. No.	Subjects	Number of topics	Number of outcomes
1.	**General Surgery**	30	133
2.	**Ophthalmology**	09	60
3.	**Otorhinolaryngology**	04	76
4.	**Obstetrics & Gynaecology**	38	126
5.	**Orthopedics**	14	39
6.	**Anesthesiology**	10	46
7.	**Radiodiagnosis**	01	13
8.	**Radiotherapy**	05	16
9.	**Dentistry**	05	23
	Total	**116**	**532**

Section 3

Sample topics used for alignment & integration

Section 3 contains a sample selection of topics that run across the phases which can be used for alignment and integration. These are suggestions and institutions can select their own set of topics which can run across phases.

It is important to design the curriculum with a view to ensure with several broad outcomes in mind: a) achievement of the broad competencies by the learner at the end of the MBBS program, b) retain the subject - wise character of learning and assessment and ensure that phase-wise subject outcomes are met and assessed, c) teaching topics that are similar together thereby reducing redundancy and allowing the learner to integrate the concept as the most important step in integration (alignment or temporal coordination) (see document on integration), and d) align learning and assessment experiences to the outcome and the level of achievement specified.

Understanding the competencies table

Understanding the competencies table

A	B	C	D	E	F	G	H	I	J
No.	**Competencies**	**Domain**	**K/KH/SH/P**	**Core**	**Suggested Teaching Learning Method**	**Suggested Assessment method**	**No. required to certify (P)**	**Vertical Integration**	**Horizontal Integration**
Physiology									
Summary **Name of Topic: General Physiology** **Number of Competencies: (08)**									
PY1.1	Describe the structure and functions of a	K	KH	Y	Lectures, Small group discussion	Written/Viva			Biochemistry
IM25.4	Elict *document* and present a medical history that helps delineate the	S	SH	Y	Bed Side clinic, DOAP	Skill assessment		Community Medicine	

Unique number of the competency. First two alphabets represent the subject (see list); number following alphabet reflects topic number, following period is a running number.

Description of competency

Identifies the domain or domains addressed
K - Knowledge
S - Skill
A - Attitude
C - Communication

Identifies the level of competency required based on the Miller's pyramid
K - Knows
KH - Knows How
S - Skill
SH - Show How
P - Perform independently

Identifies if the competency is core or desirable.
Y indicates Core; N-non-core

Identifies the suggested learning method.
DOAP - **D**emonstrate (by Student) Observe, Assist Perform)

Identifies the suggested assessment method
Skill assessment - Clinics, Skills lab, Practicals etc.

no of times a skill needs to be done independently to be certified for independent performance; Rarely used in UG

Subject (s) in other phases with which the competency can be vertically integrated to increase relevance or improve basic understanding

Subject (s) in the same phase with which the competency can be horizontally integrated or aligned to allow a more wholesome understanding

***Numbers given are for illustrative purposes only and should not be compared with the same in curriculum documents**

Deriving learning objectives from competencies

Deriving learning objectives from competencies

K	Knows	A knowledge attribute – Usually enumerates or describes
KH	Knows how	A higher level of knowledge – is able to discuss or analyse
S	Shows	A skill attribute: is able to identify or demonstrate the steps
SH	Shows how	A skill attribute: is able to interpret / demonstrate a complex procedure requiring thought, knowledge and behaviour
P	Performs (under supervision or independently)	Mastery for the level of competence - When done independently under supervision a pre-specified number of times - certification or capacity to perform independently results

Competency: An **observable** ability of a health professional, **integrating multiple components** such as knowledge, skills, values and attitudes.

PA42.3*	**Identify the etiology of meningitis based on given CSF parameters**	**K/S**	**SH**	**Y**

PA42.1*	At the end of the session the **phase II student** must be able to enumerate the most common causes of meningitis correctly
PA42.2*	At the end of the session the **phase II student** must be able to enumerate the components of CSF analysis correctly
PA42.3*	At the end of the session the **phase II student** must be able to **describe** the CSF features for a given etiology of meningitis **accurately**
PA42.4*	At the end of the session the **phase II student** must be able to identify the aetiology of meningitis correctly from a **given set of CSF parameters**

Audience - who will do the behavior

Behavior - What should the learner be able to do?

Condition - Under what conditions should the learner be able to do it?

Degree – How well must it be done

Objective: Statement of what a learner should be able to do at the end of a specific learning experience
***Numbers given are for illustrative purposes only and should not be compared with the same in curriculum documents**

Deriving learning methods from competencies

Deriving learning methods from competencies

Competency: An **observable** ability of a health professional, **integrating multiple components** such as knowledge, skills, values and attitudes.

PA42.3*	**Identify** the etiology of meningitis based on given CSF parameters	K/S	SH	Y

Objective: Statement of what a learner should be able to do at the end of a specific learning experience

PA42.1*	At the end of the session the **Phase II student** must be able to enumerate the most common causes of meningitis **correctly**
PA42.2*	At the end of the session the **Phase II student** must be able to enumerate the components of a CSF analysis correctly
PA42.3*	At the end of the session the **Phase II student** must be able to **describe** the CSF features for a given etiologic of meningitis **accurately**
PA42.4*	At the end of the session the **Phase II student** must the able to identify the aetiology of meningitis correctly from a **given set of CSF parameters**

Lecture or small group discussion

Related objectives can be combined into one teaching session

small group discussion, practical session

*Numbers given are for illustrative purposes only and should not be compared with the same in curriculum documents

Deriving assessment methods from competencies

Deriving assessment methods from competencies-1

Competency: An **observable** ability of a health professional, **integrating multiple components** such as knowledge, skills, values and attitudes.

PA42.3*	**Identify** the etiology of meningitis based on given CSF parameters	K/S	SH	Y

Objective: Statement of what a learner should be able to do at the end of a specific learning experience

PA42.1*	At the end of the session the Phase II student must be able to enumerate the most common causes of meningitis correctly	Short note or part of structured essay: Enumerate 5 causes of meningitis based on their prevalence in India
PA42.2*	At the end of the session the **Phase II student** must be able to enumerate the components of a CSF analysis correctly	Short note or part of structured essay: Enumerate the components tested in a CSF analysis
PA42.3*	At the end of the session the **Phase II student** must be able to **describe** the CSF features for a given aetiology of meningitis a**ccurately**	Short note or part of structured essay: Describe the CSF findings that are characteristic of tuberculous meningitis
PA42.4*	At the end of the session the **Phase II student** must the able to identify the aetiology of meningitis correctly from a **given set of CSF parameters**	Short note / part of the structured essay/ Skill station/ Viva voce Review the CSF findings in the following patient and identify (write or vocalise) the most likely etiology

*** Numbers given are for illustrative purposes only and should not be compared with numbers in the curriculum document**

Deriving assessment methods from competencies-2

Competency: An **observable** ability of a health professional, **integrating multiple components** such as knowledge, skills, values and attitudes.

MI2.4*	List the common microbial agents causing anemia. Describe the morphology, mode of infection and discuss the pathogenesis, clinical course, diagnosis and prevention and treatment of the common microbial agents causing Anemia.	K	KH	Y	Didactic Small group discussion	Written/ Viva voce	Medicine	Pathology

Objective: Statement of what a learner should be able to do at the end of a specific learning experience

MI2.1*	Enumerate the common microbial agents causing anaemia
MI2.2*	Describe the morphology of agent (1,2 etc)
MI2.3*	Describe the mode of infection of agent in humans
MI2.4*	Discuss the pathogenesis of anemia caused by agent
MI2.5*	Describe the clinical course of infection by agent
MI2.6*	Enumerate the diagnostic tests to identify the aetiology of agent as a cause of anemia
MI2.7*	Discuss the methods to prevent infection by agent
MI2.8*	Describe the treatment of infection by agent

Integrate concept - not necessarily teachers
Plan session with teachers of both subjects -teachers from both subjects usually not needed. Ensure redundancy and duplication by reviewing both subjects

Horizontally aligned and integrated with pathology

Vertically integrated with General Medicine

Integrate concept - not necessarily teachers Plan session with teachers from both phases. Make a decision on how much of the information needs to be brought down to this phase to make it relevant. Consider how a competency can ascend over phases: for eg. - can be at a KH -(know how) in phase II but becomes SH in phase III. For vertical integration with clinical subjects, use of a case to link the concept (a well written paper, case is sufficient). Using teachers from both phases is rarely required

The concept of integration

Concept of integration used in the Manual

Integration is a learning experience that allows the learner to perceive relationships from blocks of knowledge and develop a unified view of its basis and its application. The GMR 2018 applies these principles to the extent that will retain the strengths of silo - based education and assessment while providing experiences that will allow learners to integrate concepts.

Keeping this in mind, the Regulations recommend temporal coordination as described by Harden (called alignment in this document) as the major method to be followed allowing similar topics in different subjects to be thought separately but during the same time frame (Figure 1a).

In a small proportion - not to exceed 20% of the total curriculum an attempt can be made to Share (Figure 1b) topics or Correlate (Figure 1c) topics by using an integration session. The integration session most preferred will be a case based discussion in an appropriate format ensuring that elements in the same phase (horizontal) and from other phases are addressed. Care must be taken to ensure that achievement phase - based objectives are given primacy - the integrative elements from other phases are used only to provide adequate recall and understand the clinical application of concepts. It must be emphasized that integration does not necessarily require multiple teachers in each class. Experts from each phase and subject may be involved in the lesson planning but not it in its delivery unless deemed necessary.

As much as possible the necessary correlates from other phases must also be introduced while discussing a topic in a given subject - Nesting (Figure 1d) (Harden). Topics that cannot be aligned and integrated must be provided adequate time in the curriculum throughout the year.

Assessment will continue to be subject based. However, efforts must be made to ensure that phase appropriate correlates are tested to determine if the learner has internalized and integrated the concept and its application.

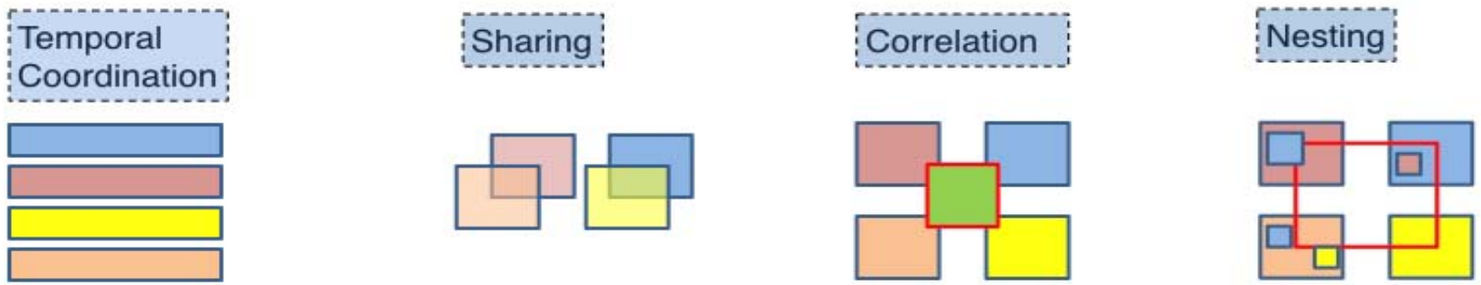

Figure 1 : Integration concepts framed in the GMR. Coloured boxes represent subjects. 1 a. Temporal coordination: The timetable is adjusted so that topics within the subjects or disciplines which are related, are scheduled at the same time. b. Sharing: Two disciplines may agree to plan and jointly implement a teaching program c. Correlation: the emphasis remains on disciplines or subjects with subject-based courses taking up most of the curriculum time. Within this framework, an integrated teaching session or course is introduced in addition to the subject-based teaching (green box with red border) d. Nesting: the teacher targets, within a subject-based course, skills relating to other subjects. Adapted from Harden R Med Edu 2000. 34; 551

Definitions used in the Manual

1. **Goal:** A projected state of affairs that a person or system plans to achieve.

   In other words: Where do you want to go? or What do you want to become?

2. **Competency:** The habitual and judicious use of communication, knowledge, technical skills, clinical reasoning, emotions, values, and reflection in daily practice for the benefit of the individual and community being served.

   In other words: What should you have? or What should have changed?

3. **Objective:** Statement of what a learner should be able to do at the end of a specific learning experience.

   In other words: What the Indian Medical Graduate should know, do, or behave.

Action Verbs used in this manual

Knowledge	**Skill**	**Attitude/communicate**
Enumerate	Identify	Counsel
List	Demonstrate	Inform
Describe	Perform under supervision	Demonstrate understanding of
Discuss	Perform independently	
Differentiate	Document	
Define	Present	
Classify	Record	
Choose	Interpret	
Elicit		
Report		

Note:

1. Specified essential competencies only will be required to be performed independently at the end of the final year MBBS.
2. The word ‘perform’ or ‘do’ is used ONLY if the task has to be done on patients or in laboratory practical in the pre/para- clinical phases.
3. Most tasks that require performance during undergraduate years will be performed under supervision.
4. If a certification to perform independently has been done, then the number of times the task has to be performed under supervision will be indicated in the last column.

Explanation of terms used in this manual

Lecture	Any instructional large group method including traditional lecture and interactive lecture
Small group discussion	Any instructional method involving small groups of students in an appropriate learning context
DOAP (Demonstration-Observation - Assistance - Performance)	A practical session that allows the student to observe a demonstration, assist the performer, perform in a simulated environment, perform under supervision or perform independently
Skill assessment	A session that assesses the skill of the student including those in the practical laboratory, skills lab, skills station that uses mannequins/ paper case/simulated patients/real patients as the context demands
Core	A competency that is necessary in order to complete the requirements of the subject (traditional must know)
Non-Core	A competency that is optional in order to complete the requirements of the subject (traditional nice (good) to know/ desirable to know)
National Guidelines	Health programs as relevant to the competency that are part of the National Health Program

Domains of learning

K	Knowledge
S	Skill
A	Attitude
C	Communication

Levels of competency

K	Knows	A knowledge attribute - Usually enumerates or describes
KH	Knows how	A higher level of knowledge - is able to discuss or analyze
S	Shows	A skill attribute: is able to identify or demonstrate the steps
SH	Shows how	A skill attribute: is able to interpret/ demonstrate a complex procedure requiring thought, knowledge and behavior
P	Performs (under supervision or independently)	Mastery for the level of competence - When done independently under supervision a pre-specified number of times - certification or capacity to perform independently results

Note:

In the table of competency - the highest level of competency acquired is specified and implies that the lower levels have been acquired already. Therefore, when a student is able to SH - Show how - an informed consent is obtained - it is presumed that the preceding steps - the knowledge, the analytical skills, the skill of communicating have all been obtained.

It may also be noted that attainment of the highest level of competency may be obtained through steps spread over several subjects or phases and not necessarily in the subject or the phase in which the competency has been identified.

Volume III

Competency based Undergraduate Curriculum

in

Surgery and Allied subjects

GENERAL SURGERY (CODE: SU)

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
GENERAL SURGERY									
Topic: Metabolic response to injury		**Number of competencies: (03)**				**Number of procedures that require certification: (NIL)**			
SU1.1	Describe Basic concepts of homeostasis, enumerate the metabolic changes in injury and their mediators.	K	KH	Y	Lecture, Bed side clinic, Small group discussion	Written/ Viva voce		Physiology, Biochemistry	
SU1.2	Describe the factors that affect the metabolic response to injury.	K	KH	Y	Lecture, Bed side clinic, Small group discussion	Written/ Viva voce		Biochemistry	
SU1.3	Describe basic concepts of perioperative care.	K	KH	Y	Lecture, Bed side clinic, Small group discussion	Written/ Viva voce			
Topic: Shock		**Number of competencies: (03)**				**Number of procedures that require certification: (NIL)**			
SU2.1	Describe Pathophysiology of shock, types of shock & principles of resuscitation including fluid replacement and monitoring.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
SU2.2	Describe the clinical features of shock and its appropriate treatment.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
SU2.3	Communicate and counsel patients and families about the treatment and prognosis of shock demonstrating empathy and care	A/C	SH	Y	DOAP session	Skill assessment		AETCOM	
Topic: Blood and blood components		**Number of competencies: (03)**				**Number of procedures that require certification: (NIL)**			
SU3.1	Describe the Indications and appropriate use of blood and blood products and complications of blood transfusion.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
SU3.2	Observe blood transfusions.	S	SH	Y	Small group discussion, DOAP session	Skills assessment/ Log book			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
SU3.3	Counsel patients and family/ friends for blood transfusion and blood donation.	A/C	SH	Y	DOAP session	Skills assessment			
Topic: Burns		**Number of competencies: (04)**				**Number of procedures that require certification: (NIL)**			
SU4.1	Elicit document and present history in a case of Burns and perform physical examination. Describe Pathophysiology of Burns.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology	
SU4.2	Describe Clinical features, Diagnose type and extent of burns and plan appropriate treatment.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
SU4.3	Discuss the Medicolegal aspects in burn injuries.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
SU4.4	Communicate and counsel patients and families on the outcome and rehabilitation demonstrating empathy and care.	A /C	SH	Y	Small group discussion, Role play, Skills assessment	Viva voce			
Topic: Wound healing and wound care		**Number of competencies: (04)**				**Number of procedures that require certification: (NIL)**			
SU5.1	Describe normal wound healing and factors affecting healing.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
SU5.2	Elicit, document and present a history in a patient presenting with wounds.	C	SH	Y	Lecture, Small group discussion	Written/ Viva voce			
SU5.3	Differentiate the various types of wounds, plan and observe management of wounds.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
SU5.4	Discuss medico legal aspects of wounds	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
Topic: Surgical infections		**Number of competencies: (02)**			**Number of procedures that require certification: (NIL)**				
SU6.1	Define and describe the aetiology and pathogenesis of surgical Infections	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology	
SU6.2	Enumerate Prophylactic and therapeutic antibiotics Plan appropriate management	**K**	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
Topic: Surgical Audit and Research		**Number of competencies: (02)**			**Number of procedures that require certification: (NIL)**				
SU7.1	Describe the Planning and conduct of Surgical audit	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine	
SU7.2	Describe the principles and steps of clinical research in General Surgery	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine	
Topic: Ethics		**Number of competencies: (03)**			**Number of procedures that require certification: (NIL)**				
SU8.1	Describe the principles of Ethics as it pertains to General Surgery	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce/ Skill assessment	-	Forensic Medicine, AETCOM	
SU8.2	Demonstrate Professionalism and empathy to the patient undergoing General Surgery	A/C	SH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce/ Skill assessment		Forensic Medicine, AETCOM	
SU8.3	Discuss Medico-legal issues in surgical practice	A/C	KH	Y	Lecture, Small group discussion	Written/ Viva voce/ Skill assessment		Forensic Medicine, AETCOM	
Topic: Investigation of surgical patient		**Number of competencies (03)**			**Number of procedures that require certification: (NIL)**				
SU9.1	Choose appropriate biochemical, microbiological, pathological, imaging investigations and interpret the investigative data in a surgical patient	C	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, Microbiology, Pathology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
SU9.2	Biological basis for early detection of cancer and multidisciplinary approach in management of cancer	C	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
SU9.3	Communicate the results of surgical investigations and counsel the patient appropriately	C	SH	Y	DOAP session	Skill assessment			
Topic: Pre, intra and post- operative management. **Number of competencies: (04)** **Number of procedures that require certification: (NIL)**									
SU10.1	Describe the principles of perioperative management of common surgical procedures	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
SU10.2	Describe the steps and obtain informed consent in a simulated environment	S/A/C	SH	Y	DOAP session	Skill assessment/ Log book		AETCOM	
SU10.3	Observe common surgical procedures and assist in minor surgical procedures; Observe emergency lifesaving surgical procedures.	S	KH	Y	DOAP sessions	Log book			
SU10.4	Perform basic surgical Skills such as First aid including suturing and minor surgical procedures in simulated environment	S	P	Y	DOAP session	Skill assessment			
Topic: Anaesthesia and pain management **Number of competencies: (06)** **Number of procedures that require certification: (NIL)**									
SU11.1	Describe principles of Preoperative assessment.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Anaesthesiology
SU11.2	Enumerate the principles of general, regional, and local Anaesthesia.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Anaesthesiology
SU11.3	Demonstrate maintenance of an airway in a mannequin or equivalent	S	SH	Y	DOAP session	Skill assessment			Anaesthesiology
SU11.4	Enumerate the indications and principles of day care General Surgery	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
SU11.5	Describe principles of providing post-operative pain relief and management of chronic pain.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Anaesthesiology
SU11.6	Describe Principles of safe General Surgery	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
Topic: Nutrition and fluid therapy		**Number of competencies: (03)**				**Number of procedures that require certification: (NIL)**			
SU12.1	Enumerate the causes and consequences of malnutrition in the surgical patient	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce		Physiology	
SU12.2	Describe and discuss the methods of estimation and replacement of the fluid and electrolyte requirements in the surgical patient	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce		Physiology	
SU12.3	Discuss the nutritional requirements of surgical patients, the methods of providing nutritional support and their complications	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce		Biochemistry	
Topic: Transplantation		**Number of competencies: (04)**				**Number of procedures that require certification: (NIL)**			
SU13.1	Describe the immunological basis of organ transplantation	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology	
SU13.2	Discuss the Principles of immunosuppressive therapy.Enumerate Indications, describe surgical principles, management of organ transplantation	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology, Pharmacology	
SU13.3	Discuss the legal and ethical issues concerning organ donation	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		AETCOM	
SU13.4	Counsel patients and relatives on organ donation in a simulated environment	S	SH	Y	DOAP session	Skill assessment		AETCOM	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
Topic: Basic Surgical Skills		**Number of competencies: (04)**				**Number of procedures that require certification: (NIL)**			
SU14.1	Describe Aseptic techniques, sterilization and disinfection.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology	
SU14.2	Describe Surgical approaches, incisions and the use of appropriate instruments in Surgery in general.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
SU14.3	Describe the materials and methods used for surgical wound closure and anastomosis (sutures, knots and needles)	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
SU14.4	Demonstrate the techniques of asepsis and suturing in a simulated environment	S	SH	Y	DOAP session	Skill assessment/ Log book			
Topic: Biohazard disposal		**Number of competencies: (01)**				**Number of procedures that require certification: (NIL)**			
SU15.1	Describe **c**lassification of hospital waste and appropriate methods of disposal.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology	
Topic: Minimally invasive General Surgery		**Number of competencies: (01)**				**Number of procedures that require certification: (NIL)**			
SU16.1	Minimally invasive General Surgery: Describe indications advantages and disadvantages of Minimally invasive General Surgery	K	K	Y	Lecture, Demonstration, Bedside clinic, Discussion	Theory/ Practical / Orals/Written/ Viva voce			
Topic: Trauma		**Number of competencies: (10)**				**Number of procedures that require certification: (NIL)**			
SU17.1	Describe the Principles of FIRST AID	S	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
SU17.2	Demonstrate the steps in Basic Life Support. Transport of injured patient in a simulated environment	S	SH	Y	DOAP session	Skill assessment			Anaesthesiology

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
SU17.3	Describe the Principles in management of mass casualties	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
SU17.4	Describe Pathophysiology, mechanism of head injuries	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
SU17.5	Describe clinical features for neurological assessment and GCS in head injuries	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
SU17.6	Chose appropriate investigations and discuss the principles of management of head injuries	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
SU17.7	Describe the clinical features of soft tissue injuries. Chose appropriate investigations and discuss the principles of management.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
SU17.8	Describe the pathophysiology of chest injuries.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
SU17.9	Describe the clinical features and principles of management of chest injuries.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
SU17.10	Demonstrate Airway maintenance. Recognize and manage tension pneumothorax, hemothorax and flail chest in simulated environment.	S	SH	Y	DOAP session	Skill assessment/ Log book			Anaesthesiology
Topic: Skin and subcutaneous tissue		**Number of competencies: (03)**				**Number of procedures that require certification: (NIL)**			
SU18.1	Describe the pathogenesis, clinical features and management of various cutaneous and subcutaneous infections.	K	KH	Y	Lecture, Small group Discussion	Written/ Viva voce			
SU18.2	Classify skin tumors Differentiate different skin tumors and discuss their management.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce/ Skill assessment			
SU18.3	Describe and demonstrate the clinical examination of surgical patient including swelling and order relevant investigation for diagnosis. Describe and discuss appropriate treatment plan.	S	SH	Y	Bedside clinic, Small group discussion, DOAP session	Skill assessment			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
Topic: Developmental anomalies of face, mouth and jaws		**Number of competencies: (02)**			**Number of procedures that require certification: (NIL)**				
SU19.1	Describe the etiology and classification of cleft lip and palate	K	KH	Y	Lecture, Small group Discussion	Written/ Viva voce		Human Anatomy	
SU19.2	Describe the Principles of reconstruction of cleft lip and palate	K	KH	Y	Lecture, Small group Discussion	Written/ Viva voce		Human Anatomy	
Topic: Oropharyngeal cancer		**Number of competencies: (02)**			**Number of procedures that require certification: (NIL)**				
SU20.1	Describe etiopathogenesis of oral cancer symptoms and signs of oropharyngeal cancer.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		ENT	
SU20.2	Enumerate the appropriate investigations and discuss the Principles of treatment.	K	K	Y	Lecture, Small group discussion	Written/ Viva voce			
Topic: Disorders of salivary glands		**Number of competencies: (02)**			**Number of procedures that require certification: (NIL)**				
SU21.1	Describe surgical anatomy of the salivary glands, pathology, and clinical presentation of disorders of salivary glands	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
SU21.2	Enumerate the appropriate investigations and describe the Principles of treatment of disorders of salivary glands	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
Topic: Endocrine General Surgery: Thyroid and parathyroid		**Number of competencies: (06)**			**Number of procedures that require certification: (NIL)**				
SU22.1	Describe the applied anatomy and physiology of thyroid	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy	
SU22.2	Describe the etiopathogenesis of thyroidal swellings	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
SU22.3	Demonstrate and document the correct clinical examination of thyroid swellings and discus the differential diagnosis and their management	S	SH	Y	Bedside clinic	Skill assessment			
SU22.4	Describe the clinical features, classification and principles of management of thyroid cancer	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
SU22.5	Describe the applied anatomy of parathyroid	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy	
SU22.6	Describe and discuss the clinical features of hypo - and hyperparathyroidism and the principles of their management	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			General Medicine
Topic: Adrenal glands		**Number of competencies: (03)**				**Number of procedures that require certification: (NIL)**			
SU23.1	Describe the applied anatomy of adrenal glands	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy	
SU23.2	Describe the etiology, clinical features and principles of management of disorders of adrenal gland	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			General Medicine
SU23.3	Describe the clinical features, principles of investigation and management of Adrenal tumors	K	KH	Y	Lecture, Small group discussion, Demonstration	Written/ Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
Topic: Pancreas		**Number of competencies: (03)**			**Number of procedures that require certification: (NIL)**				
SU24.1	Describe the clinical features, principles of investigation, prognosis and management of pancreatitis.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy	
SU24.2	Describe the clinical features, principles of investigation, prognosis and management of pancreatic endocrine tumours	K	KH	Y	Lecture, Small group discussion, Demonstration	Written/ Viva voce			
SU24.3	Describe the principles of investigation and management of Pancreatic disorders including pancreatitis and endocrine tumors.	K	KH	Y	Lecture, Small group discussion, Demonstration	Written/ Viva voce/ Skill assessment			
Topic: Breast		**Number of competencies: (05)**			**Number of procedures that require certification: (NIL)**				
SU25.1	Describe applied anatomy and appropriate investigations for breast disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce/ Skill assessment		Human Anatomy	
SU25.2	Describe the etiopathogenesis, clinical features and principles of management of benign breast disease including infections of the breast	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce/ Skill assessment			
SU25.3	Describe the etiopathogenesis, clinical features, Investigations and principles of treatment of benign and malignant tumours of breast.	K	KH	Y	Lecture, Small group discussion, Demonstration	Written/ Viva voce/ Skill assessment		Radiodiagnosis	
SU25.4	Counsel the patient and obtain informed consent for treatment of malignant conditions of the breast	A/ C	SH	Y	DOAP session	Skill assessment			
SU25.5	Demonstrate the correct technique to palpate the breast for breast swelling in a mannequin or equivalent	S	SH	Y	DOAP session	Skill assessment			
Topic: Cardio-thoracic General Surgery- Chest - Heart and Lungs		**Number of competencies: (04)**			**Number of procedures that require certification: (NIL)**				
SU26.1	Outline the role of surgery in the management of coronary heart disease, valvular heart diseases and congenital heart diseases	K	K	Y	Lecture, Small group discussion	Written/ Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
SU26.3	Describe the clinical features of mediastinal diseases and the principles of management	K	K	Y	Lecture, Small group discussion	Written/ Viva voce			
SU26.4	Describe the etiology, pathogenesis, clinical features of tumors of lung and the principles of management	K	K	Y	Lecture, Small group discussion	Written/ Viva voce			
Topic: Vascular diseases		**Number of competencies: (08)**				**Number of procedures that require certification: (NIL)**			
SU27.1	Describe the etiopathogenesis, clinical features, investigations and principles of treatment of occlusive arterial disease.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce/ Skill assessment			
SU27.2	Demonstrate the correct examination of the vascular system and enumerate and describe the investigation of vascular disease	S	SH	Y	DOAP session	Skill assessment			
SU27.3	Describe clinical features, investigations and principles of management of vasospastic disorders	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
SU27.4	Describe the types of gangrene and principles of amputation	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce/ Skill assessment			
SU27.5	Describe the applied anatomy of venous system of lower limb	K	K	Y	Lecture, Small group discussion	Written/ Viva voce			
SU27.6	Describe pathophysiology, clinical features, Investigations and principles of management of DVT and Varicose veins	K	KH	Y	Lecture, Small group discussion, Demonstration	Written/ Viva voce/ Skill assessment			
SU27.7	Describe pathophysiology, clinical features, investigations and principles of management of Lymph edema, lymphangitis and Lymphomas	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce/ Skill assessment			
SU27.8	Demonstrate the correct examination of the lymphatic system	S	SH	Y	DOAP session, Bedside clinic	Skill assessment			
Topic: Abdomen		**Number of competencies: (18)**				**Number of procedures that require certification: (NIL)**			
SU28.1	Describe pathophysiology, clinical features, Investigations and principles of management of Hernias	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce/ Skill assessment			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
SU28.2	Demonstrate the correct technique to examine the patient with hernia and identify different types of hernias.	S	SH	Y	DOAP session, Bedside clinic	Skill assessment			
SU28.3	Describe causes, clinical features, complications and principles of mangament of peritonitis	K	K	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce			
SU28.4	Describe pathophysiology, clinical features, investigations and principles of management of Intra-abdominal abscess, mesenteric cyst, and retroperitoneal tumors	K	K	Y	Lecture, Small group discussion, Demonstration	Written/ Viva voce			
SU28.5	Describe the applied Anatomy and physiology of esophagus	K	K	Y	Lecture, Small group discussion, Demonstration	Written/ Viva voce		Human Anatomy, Physiology	
SU28.6	Describe the clinical features, investigations and principles of management of benign and malignant disorders of esophagus	K	K	Y	Lecture, Small group discussion, Demonstration	Written/ Viva voce			
SU28.7	Describe the applied anatomy and physiology of stomach	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy	
SU28.8	Describe and discuss the aetiology, the clinical features, investigations and principles of management of congenital hypertrophic pyloric stenosis, Peptic ulcer disease, Carcinoma stomach	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce/ Skill assessment			
SU28.9	Demonstrate the correct technique of examination of a patient with disorders of the stomach	S	SH	Y	DOAP session, Bedside clinic	Skill assessment			
SU28.10	Describe the applied anatomy of liver. Describe the clinical features, Investigations and principles of management of liver abscess, hydatid disease, injuries and tumors of the liver	K	KH	Y	Lecture, Small group discussion, Demonstration	Written/ Viva voce		Human Anatomy	
SU28.11	Describe the applied anatomy of spleen. Describe the clinical features, investigations and principles of management of splenic injuries. Describe the post-splenectomy sepsis - prophylaxis	K	KH	Y	Lecture, Small group discussion, Demonstration	Written/ Viva voce		Human Anatomy	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
SU28.12	Describe the applied anatomy of biliary system. Describe the clinical features, investigations and principles of management of diseases of biliary system	K	KH	Y	Lecture, Small group discussion, Demonstration	Written/ Viva voce		Human Anatomy	
SU28.13	Describe the applied anatomy of small and large intestine	K	KH	Y	Lecture, Small group discussion, Demonstration	Written/ Viva voce		Human Anatomy	
SU28.14	Describe the clinical features, investigations and principles of management of disorders of small and large intestine including neonatal obstruction and Short gut syndrome	K	KH	Y	Lecture, Small group discussion, Demonstration	Written/ Viva voce			
SU28.15	Describe the clinical features, investigations and principles of management of diseases of Appendix including appendicitis and its complications.	K	KH	Y	Lecture, Small group discussion, Demonstration	Written/ Viva voce/ Skill assessment			
SU28.16	Describe applied anatomy including congenital anomalies of the rectum and anal canal	K	KH	Y	Lecture, Small group discussion, Demonstration	Written/ Viva voce/ Skill assessment		Human Anatomy	
SU28.17	Describe the clinical features, investigations and principles of management of common anorectal diseases	K	KH	Y	Lecture, Small group discussion, Demonstration	Written/ Viva voce/ Skill assessment			
SU28.18	Describe and demonstrate clinical examination of abdomen. Order relevant investigations. Describe and discuss appropriate treatment plan	S	SH	Y	Bedside clinic, DOAP session, Small group discussion	Skill assessment			
Topic: Urinary System		**Number of competencies: (11)**				**Number of procedures that require certification: (NIL)**			
SU29.1	Describe the causes, investigations and principles of management of Hematuria	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
SU29.2	Describe the clinical features, investigations and principles of management of congenital anomalies of genitourinary system	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
SU29.3	Describe the Clinical features, Investigations and principles of management of urinary tract infections	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Microbiology	
SU29.4	Describe the clinical features, investigations and principles of management of hydronephrosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
SU29.5	Describe the clinical features,investigations and principles of management of renal calculi	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
SU29.6	Describe the clinical features, investigations and principles of management of renal tumours	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
SU29.7	Describe the principles of management of acute and chronic retention of urine	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
SU29.8	Describe the clinical features, investigations and principles of management of bladder cancer	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
SU29.9	Describe the clinical features, investigations and principles of management of disorders of prostate	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce/ Skill assessment			
SU29.10	Demonstrate a digital rectal examination of the prostate in a mannequin or equivalent	S	SH	Y	DOAP session	Skill assessment			
SU29.11	Describe clinical features, investigations and management of urethral strictures	K	KH	Y	Lecture, Small group discussion, Demonstration	Written/ Viva voce/ Skill assessment			
Topic: Penis, Testis and scrotum		**Number of competencies: (06)**				**Number of procedures that require certification: (NIL)**			
SU30.1	Describe the clinical features, investigations and principles of management of phimosis, paraphimosis and carcinoma penis.	K	KH	Y	Lecture, Small group discussion, Demonstration	Written/ Viva voce/ Skill assessment			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
SU30.2	Describe the applied anatomy clinical features, investigations and principles of management of undescended testis.	K	KH	Y	Lecture, Small group discussion, Demonstration	Written/ Viva voce/ Skill assessment		Human Anatomy	
SU30.3	Describe the applied anatomy clinical features, investigations and principles of management of epidydimo-orchitis	K	KH	Y	Lecture, Small group discussion, Demonstration	Written/ Viva voce/ Skill assessment		Human Anatomy	
SU30.4	Describe the applied anatomy clinical features, investigations and principles of management of varicocele	K	KH	Y	Lecture, Small group discussion, Demonstration	Written/ Viva voce/ Skill assessment		Human Anatomy	
SU30.5	Describe the applied anatomy, clinical features, investigations and principles of management of Hydrocele	K	KH	Y	Lecture, Small group discussion, Demonstration	Written/ Viva voce/ Skill assessment		Human Anatomy	
SU30.6	Describe classification, clinical features, investigations and principles of management of tumours of testis	K	KH	Y	Lecture, Small group discussion, Demonstration	Written/ Viva voce/ Skill assessment			
	Column C: K- Knowledge, S – Skill , A - Attitude / professionalism, C- Communication. **Column D: K – Knows, KH - Knows How, SH - Shows how, P- performs independently,** **Column F: DOAP session – Demonstrate, Observe, Assess, Perform.** **Column H: If entry is P: indicate how many procedures must be done independently for certification/ graduation**								
Integration									
	Human Anatomy								
AN6.3	Explain the concept of lymphoedema and spread of tumors via lymphatics and venous system	K	KH	N	Lecture	Written		General Surgery	
AN9.2	Breast-Describe the location, extent, deep relations, structure, age changes, blood supply, lymphatic drainage, microanatomy and applied anatomy of breast	K	KH	Y	Practical, Lecture	Written/ Viva voce		General Surgery	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
AN10.4	Describe the anatomical groups of axillary lymph nodes and specify their areas of drainage	K	KH	Y	Practical, Lecture	Written/ Viva voce		General Surgery	
AN10.6	Explain the anatomical basis of clinical features of Erb's palsy and Klumpke's paralysis	K	KH	N	Lecture	Written		General Surgery	
AN10.7	Explain anatomical basis of enlarged axillary lymph nodes	K	KH	N	Lecture	Written		General Surgery	
AN11.3	Describe the anatomical basis of Venepuncture of cubital veins	K	KH	Y	Practical, Lecture	Written/ Viva voce		General Surgery	
AN12.8	Describe anatomical basis of Claw hand	K	KH	Y	Lecture	Written/ Viva voce		General Surgery	
AN12.10	Explain infection of fascial spaces of palm	K	KH	N	Lecture	Written		General Surgery	
AN12.11	Identify, describe and demonstrate important muscle groups of dorsal forearm with attachments, nerve supply and actions	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ Skill assessment		General Surgery	
AN12.12	Identify & describe origin, course, relations, branches (or tributaries), termination of important nerves and vessels of back of forearm	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ Skill assessment		General Surgery	
AN12.13	Describe the anatomical basis of Wrist drop	K	KH	Y	Lecture	Written/Viva voce		General Surgery	
AN12.14	Identify & describe compartments deep to extensor retinaculum	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ Skill assessment		General Surgery	
AN15.3	Describe and demonstrate boundaries, floor, roof and contents of femoral triangle	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ Skill assessment		General Surgery	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
AN15.4	Explain anatomical basis of Psoas abscess & Femoral hernia	K	KH	N	Lecture, DOAP session	Written/ Viva voce		General Surgery	
AN16.2	Describe anatomical basis of sciatic nerve injury during gluteal intramuscular injections	K	KH	Y	Lecture, DOAP session	Written/ Viva voce		General Surgery	
AN16.3	Explain the anatomical basis of Trendelenburg sign	K	KH	Y	Lecture, DOAP session	Written/ Viva voce		General Surgery	
AN18.3	Explain the anatomical basis of foot drop	K	KH	Y	Lecture, DOAP session	Written/ Viva voce		General Surgery	
AN19.3	Explain the concept of “Peripheral heart”	K	KH	Y	Lecture	Written/ Viva voce		General Surgery	
AN20.4	Explain anatomical basis of enlarged inguinal lymph nodes	K	KH	N	Lecture	Written/ Viva voce		General Surgery	
AN20.5	Explain anatomical basis of varicose veins and deep vein thrombosis	K	KH	Y	Lecture	Written/ Viva voce		General Surgery	
AN20.9	Identify & demonstrate palpation of vessels (femoral, popliteal, dorsalis pedis, post tibial), Mid inguinal point, Surface projection of: femoral nerve, Saphenous opening, Sciatic, tibial, common peroneal & deep peroneal nerve, great and small saphenous veins	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Viva voce/ Skill assessment		General Medicine General Surgery	
AN23.1	Describe & demonstrate the external appearance, relations, blood supply, nerve supply, lymphatic drainage and applied anatomy of oesophagus	K/S	SH	Y	Practical, Lecture, DOAP session	Written/ Viva voce/ Skill assessment		General Surgery	
AN23.2	Describe & demonstrate the extent, relations, tributaries of thoracic duct and enumerate its applied anatomy	K/S	SH	Y	Practical, Lecture, DOAP session	Written/ Viva voce/ Skill assessment		General Surgery	
AN23.7	Mention the extent, relations and applied anatomy of lymphatic duct	K	KH	Y	Lecture	Written/ Viva voce		General Surgery	
AN27.1	Describe the layers of scalp, its blood supply, its nerve supply and surgical importance	K	KH	Y	Practical, Lecture	Written/ Viva voce		General Surgery	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
AN28.8	Explain surgical importance of deep facial vein	K	KH	Y	Lecture	Written		General Surgery	
AN28.9	Describe & demonstrate the parts, borders, surfaces, contents, relations and nerve supply of parotid gland with course of its duct and surgical importance	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ Skill assessment		General Surgery	
AN28.10	Explain the anatomical basis of Frey's syndrome	K	KH	N	Lecture	Written		General Surgery	
AN29.2	Explain anatomical basis of Erb's & Klumpke's palsy	K	KH	Y	Lecture	Written		General Surgery	
AN29.3	Explain anatomical basis of wry neck	K	KH	N	Lecture	Written		General Surgery	
AN30.1	Describe the cranial fossae & identify related structures.	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/Skill assessment		General Surgery	
AN30.2	Describe & identify major foramina with structures passing through them	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ Skill assessment		General Surgery	
AN33.2	Describe & demonstrate attachments, direction of fibres, nerve supply and actions of muscles of mastication	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ Skill assessment		General Surgery	
AN33.4	Explain the clinical significance of pterygoid venous plexus	K	KH	Y	Lecture	Written		General Surgery	
AN33.5	Describe the features of dislocation of temporomandibular joint	K	KH	N	Lecture	Written		General Surgery	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
AN34.1	Describe & demonstrate the morphology, relations and nerve supply of submandibular salivary gland & submandibular ganglion	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ Skill assessment		General Surgery	
AN34.2	Describe the basis of formation of submandibular stones	K	KH	N	Lecture	Written		General Surgery	
AN35.2	Describe & demonstrate location, parts, borders, surfaces, relations & blood supply of thyroid gland	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ Skill assessment		General Surgery	
AN35.5	Describe & demonstrate extent, drainage & applied anatomy of cervical lymph nodes	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ Skill assessment		General Surgery	
AN35.8	Describe the anatomically relevant clinical features of Thyroid swellings	K	KH	N	Lecture	Written		General Surgery	
AN35.9	Describe the clinical features of compression of subclavian artery and lower trunk of brachial plexus by cervical rib	K	KH	N	Lecture	Written		General Surgery	
AN43.5	Demonstrate- 1) Testing of muscles of facial expression, extraocular muscles, muscles of mastication, 2) Palpation of carotid arteries, facial artery, superficial temporal artery, 3) Location of internal and external jugular veins, 4) Location of hyoid bone, thyroid cartilage and cricoid cartilage with their vertebral levels	K/S	SH	Y	Practical	Viva voce/ Skill assessment		General Surgery	
AN43.6	Demonstrate surface projection of Thyroid gland, Parotid gland and duct, Pterion, Common carotid artery, Internal jugular vein, Subclavian vein, External jugular vein, Facial artery in the face & Accessory nerve	K/S	SH	N	Practical	Viva voce/ Skill assessment		General Surgery	
AN44.1	Describe & demonstrate the Planes (transpyloric, transtubercular, subcostal, lateral vertical, linea alba, linea semilunaris), regions & Quadrants of abdomen	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ Skill assessment		General Surgery	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
AN44.4	Describe & demonstrate extent, boundaries, contents of Inguinal canal including Hesselbach's triangle.	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ Skill assessment		General Surgery	
AN44.5	Explain the anatomical basis of inguinal hernia.	K	KH	Y	Lecture	Written/ Viva voce		General Surgery	
AN44.6	Describe & demonstrate attachments of muscles of anterior abdominal wall	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ Skill assessment		General Surgery	
AN44.7	Enumerate common Abdominal incisions	K	KH	N	Lecture	Written		General Surgery	
AN46.1	Describe & demonstrate coverings, internal structure, side determination, blood supply, nerve supply, lymphatic drainage & descent of testis with its applied anatomy	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ Skill assessment		General Surgery	
AN46.4	Explain the anatomical basis of varicocele	K	KH	N	Lecture	Written		General Surgery	
AN46.5	Explain the anatomical basis of Phimosis & Circumcision	K	KH	N	Lecture	Written		General Surgery	
AN47.1	Describe & identify boundaries and recesses of Lesser & Greater sac	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ Skill assessment		General Surgery	
AN47.2	Name & identify various peritoneal folds & pouches with its explanation.	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ Skill assessment		General Surgery	
AN47.3	Explain anatomical basis of Ascites & Peritonitis	K	KH	N	Lecture	Written		General Surgery	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
AN47.4	Explain anatomical basis of Subphrenic abscess	K	KH	N	Lecture	Written		General Surgery	
AN47.5	Describe & demonstrate major viscera of abdomen under following headings (anatomical position, external and internal features, important peritoneal and other relations, blood supply, nerve supply, lymphatic drainage and applied aspects)	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written		General Surgery	
AN47.6	Explain the anatomical basis of Splenic notch, accessory spleens, Kehr's sign, different types of vagotomy, liver biopsy (site of needle puncture), referred pain in cholecystitis, Obstructive jaundice, referred pain around umbilicus, radiating pain of kidney to groin & Lymphatic spread in carcinoma stomach	K	KH	N	Lecture	Written		General Surgery	
AN47.7	Mention the clinical importance of Calot's triangle	K	KH	N	Lecture	Written		General Surgery	
AN47.10	Enumerate the sites of portosystemic anastomosis	K	KH	Y	Lecture	Written		General Surgery	
AN47.11	Explain the anatomic basis of hematemesis & caput medusae in portal hypertension	K	KH	Y	Lecture	Written/ Viva voce		General Surgery	
AN47.14	Describe the abnormal openings of thoracoabdominal diaphragm and diaphragmatic hernia	K	KH	N	Lecture	Written		General Surgery	
AN48.5	Explain the anatomical basis of suprapubic cystostomy, Urinary obstruction in benign prostatic hypertrophy, Retroverted uterus, Prolapse uterus, Internal and external haemorrhoids, Anal fistula, Vasectomy, Tubal pregnancy & Tubal ligation	K	KH	N	Lecture	Written		General Surgery	
AN48.6	Describe neurological basis of automatic bladder	K	KH	N	Lecture	Written		General Surgery	
AN48.7	Mention the lobes involved in benign prostatic hypertrophy & prostatic cancer	K	KH	N	Lecture	Written		General Surgery	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
AN48.8	Mention the structures palpable during vaginal & rectal examination	K	KH	N	Lecture	Written		Obstetrics & Gynaecology General Surgery	
AN49.4	Describe & demonstrate boundaries, content & applied anatomy of Ischiorectal fossa	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ Skill assessment		General Surgery	
AN52.5	Describe the development and congenital anomalies of diaphragm	K	KH	Y	Lecture	Written/ Viva voce		General Surgery	
AN52.6	Describe the development and congenital anomalies of foregut, midgut & hindgut	K	KH	Y	Lecture	Written/ Viva voce		General Surgery	
AN52.7	Describe the development of urinary system	K	KH	Y	Lecture	Written/ Viva voce		General Surgery	
AN53.1	Identify & hold the bone in the anatomical position, describe the salient features, articulations & demonstrate the attachments of muscle groups	K/S	SH	Y	Lecture, DOAP session	Viva voce/ Skill assessment		General Surgery, Obstetrics & Gynaecology	
AN55.1	Demonstrate the surface marking of regions and planes of abdomen, superficial inguinal ring, deep inguinal ring , McBurney's point, Renal Angle & Murphy's point	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Viva voce/ Skill assessment		General Surgery	
AN55.2	Demonstrate the surface projections of: stomach, liver, fundus of gall bladder, spleen, duodenum, pancreas, ileocaecal junction, idneys & root of mesentery	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Viva voce/ Skill assessment		General Surgery	
Biochemistry									
BI10.1	Describe the cancer initiation promotion oncogenes & oncogene activation.	K	KH	Y	Lectures, Small group discussion	Written/ viva voce		Obstetrics & Gynaecology, General Surgery, Pathology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
BI10.2	Describe various biochemical tumor markers and the biochemical basis of cancer therapy.	K	KH	Y	Lectures, Small group discussion	Written/ viva voce		Obstetrics & Gynaecology, General Surgery, Pathology	
BI10.3	Describe the cellular and humoral components of the immune system & describe the types and structure of antibody	K	KH	Y	Lectures, Small group discussion	Written/ viva voce		Obstetrics & Gynaecology, General Surgery, Pathology	
Pathology									
PA4.1	Define and describe the general features of acute and chronic inflammation including stimuli, vascular and cellular events	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
PA4.2	Enumerate and describe the mediators of acute inflammation	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
PA5.1	Define and describe the process of repair and regeneration including wound healing and its types	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
PA6.3	Define and describe shock, its pathogenesis and its stages	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
PA8.1	Describe the diagnostic role of cytology and its application in clinical care	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
PA8.2	Describe the basis of exfoliative cytology including the technique, stains used	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce/ Skill assessment		General Surgery	
PA19.1	Enumerate the causes and describe the differentiating features of lymphadenopathy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
PA19.2	Describe the pathogenesis and pathology of tuberculous lymphadenitis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
PA19.4	Describe and discuss the pathogenesis pathology and the differentiating features of Hodgkin's and non-Hodgkin's lymphoma	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PA19.5	Identify and describe the features of Hodgkin's lymphoma in a gross and microscopic specimen	S	SH	Y	DOAP session	Skill assessment		General Surgery	
PA19.6	Enumerate and differentiate the causes of splenomegaly	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery, General Medicine	
PA22.4	Enumerate blood components and describe their clinical uses	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery, General Medicine	
PA24.4	Describe and etiology and pathogenesis and pathologic features of carcinoma of the stomach	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
PA24.5	Describe and etiology and pathogenesis and pathologic features of Tuberculosis of the intestine	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
PA24.6	Describe and etiology and pathogenesis and pathologic and distinguishing features of inflammatory bowel disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
PA24.7	Describe the etiology and pathogenesis and pathologic and distinguishing features of carcinoma of the colon	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
PA25.2	Describe the pathophysiology and pathologic changes seen in hepatic failure and their clinical manifestations, complications and consequences	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, General Surgery	
PA25.4	Describe the pathophysiology, pathology and progression of alcoholic liver disease including cirrhosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, General Surgery	
PA25.5	Describe the etiology, pathogenesis and complications of portal hypertension	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, General Surgery	
PA28.10	Describe the etiology, pathogenesis, pathology, laboratory findings, distinguishing features progression and complications of acute and chronic pyelonephritis and reflux nephropathy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy, General Surgery	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PA28.13	Define, classify and describe the etiology, pathogenesis, pathology, laboratory urinary findings, distinguishing features, progression and complications of renal stone disease and obstructive uropathy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
PA28.16	Describe the etiology, genetics, pathogenesis, pathology, presenting features and progression of urothelial tumors	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
PA29.1	Classify testicular tumors and describe the pathogenesis, pathology, presenting and distinguishing features, diagnostic tests, progression and spread of testicular tumors	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
PA29.2	Describe the pathogenesis, pathology, presenting and distinguishing features, diagnostic tests, progression and spread of carcinoma of the penis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
PA29.3	Describe the pathogenesis, pathology, hormonal dependency, presenting and distinguishing features, urologic findings and diagnostic tests of benign prostatic hyperplasia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
PA29.4	Describe the pathogenesis, pathology, hormonal dependency, presenting and distinguishing features, diagnostic tests, progression and spread of carcinoma of the prostate	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
PA29.5	Describe the etiology, pathogenesis, pathology and progression of prostatitis	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
PA31.1	Classify and describe the types, etiology, pathogenesis, pathology and hormonal dependency of benign breast disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy, General Surgery	
PA31.2	Classify and describe the epidemiology, pathogenesis, classification, morphology, prognostic factors, hormonal dependency, staging and spread of carcinoma of the breast	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PA31.3	Describe and identify the morphologic and microscopic features of carcinoma of the breast	S	SH	N	DOAP session	Skill assessment		General Surgery	
PA32.1	Enumerate, classify and describe the etiology, pathogenesis, pathology and iodine dependency of thyroid swellings	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy , Physiology, General Medicine, Pathology	
PA32.6	Describe the etiology, pathogenesis, manifestations, laboratory, morphologic features, complications and metastases of pancreatic cancer	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
PA32.9	Describe the etiology, pathogenesis, manifestations, laboratory and morphologic features of adrenal neoplasms	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy, Physiology, General Medicine, General Surgery	
Microbiology									
MI1.4	Classify and describe the different methods of sterilization and disinfection. Discuss the application of the different methods in the laboratory, in clinical and surgical practice	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
MI1.5	Choose the most appropriate method of sterilization and disinfection to be used in specific situations in the laboratory, in clinical and surgical practice	K	KH	Y	Small group discussions, Case discussion	Written/ Viva voce/ OSPE		General Surgery	
MI7.1	Describe the etio-pathogenesis and discuss the laboratory diagnosis of infections of genitourinary system	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
MI8.7	Demonstrate Infection control practices and use of Personal Protective Equipments (PPE)	S	P	Y	DOAP session	Skill assessment	3 each in (Hand hygiene & PPE)	General Surgery	Community Medicine
Community Medicine									
CM13.1	Define and describe the concept of Disaster management	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery, General Medicine	
CM13.2	Describe disaster management cycle	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery, General Medicine	
CM13.3	Describe man-made disasters in the world and in India	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		General Surgery, General Medicine	
CM13.4	Describe the details of the National Disaster management Authority	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		General Surgery, General Medicine	
Forensic Medicine & Toxicology									
FM1.9	Describe the importance of documentation in medical practice in regard to medicolegal examinations, Medical Certificates and medicolegal reports especially –maintenance of patient case records, discharge summary, prescribed registers to be maintained in Health Centres. -- maintenance of medico-legal register like accident register. -- documents of issuance of wound certificate -- documents of issuance of drunkenness certificate. -- documents of issuance of sickness and fitness certificate. -- documents for issuance of death certificate. -- documents of Medical Certification of Cause of Death - Form Number 4 and 4A -- documents for estimation of age by physical, dental and radiological examination and issuance of certificate	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Radiodiagnosis, General Surgery, General Medicine, Pediatrics	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
FM2.19	Investigation of anaesthetic, operative deaths:Describe and discuss special protocols for conduction of autopsy and for collection, preservation and dispatch of related material evidences	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Anesthesiology, General Surgery	
FM2.25	Describe types of injuries, clinical features, patho-physiology, post-mortem findings and medico-legal aspects in cases of burns, scalds, lightening, electrocution and radiations.	K	KH	Y	Lecture, Small group discussion, Autopsy, DOAP session	Written/ Viva voce/ OSPE		General Surgery	
FM3.3	Mechanical injuries and wounds: Define, describe and classify different types of mechanical injuries, abrasion, bruise, laceration, stab wound, incised wound, chop wound, defense wound, self-inflicted/fabricated wounds and their medico-legal aspects.	K	KH	Y	Lectures, Small group discussion, Bed side clinic/ DOAP session	Written/ Viva voce/ OSCE		General Surgery	
FM3.4	Mechanical injuries and wounds: define injury, assault & hurt. Describe IPC pertaining to injuries	K	KH	Y	Lectures, Small group discussion	Written/ Viva voce		General Surgery	
FM3.6	Mechanical injuries and wounds:Describe healing of injury and fracture of bones with its medico-legal importance	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	
FM3.8	Mechanical injuries and wounds:Describe and discuss different types of weapons including dangerous weapons and their examination.	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery, Orthopaedics	
FM3.9	Firearm injuries:Describe different types of firearms including structure and components, along with description of ammunition propellant charge and mechanism of fire-arms, different types of cartridges and bullets and various terminology in relation of firearm – caliber, range, choking.	K	K/KH	Y	Lecture, Small group discussion	Written/Viva voce		General Surgery, Orthopaedics	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
FM3.10	Firearm injuries: Describe and discuss wound ballistics-different types of firearm injuries, blast injuries and their interpretation, preservation and dispatch of trace evidences in cases of firearm and blast injuries, various tests related to confirmation of use of firearms	K	K/KH	Y	Lecture, Small group discussion, Bed side clinic, DOAP session	Written/ Viva voce/ OSCE		General Surgery, Orthopaedics	
FM3.11	Regional Injuries: Describe and discuss regional injuries to head (Scalp wounds, fracture skull, intracranial haemorrhages, coup and contrecoup injuries), neck, chest, abdomen, limbs, genital organs, spinal cord and skeleton	K	K/KH	Y	Lecture, Small group discussion, Bedside clinic or autopsy, DOAP session	Written/ Viva voce/ OSCE/OSPE		General Surgery, Orthopaedics	
FM3.12	Regional Injuries: Describe and discuss injuries related to fall from height and vehicular injuries – Primary and Secondary impact, Secondary injuries, crush syndrome, railway spine.	K	K/KH	Y	Lecture, Small group discussion, Bedside clinic or autopsy, DOAP session	Written/ Viva voce/ OSCE/OSPE		General Surgery, Orthopaedics	
Dermatology, Venereology & Leprosy									
DR15.3	Enumerate the indications and describe the pharmacology, indications and adverse reactions of topical and systemic drugs used in treatment of pyoderma	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		General Surgery	Microbiology, Pharmacology
DR15.4	Enumerate the indications for surgical referral	S	KH	Y	DOAP session	Written/Viva voce		General Surgery	
Anesthesiology									
AS3.1	Describe the principles of preoperative evaluation	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			General Surgery, General Medicine
AS3.2	Elicit, present and document an appropriate history including medication history in a patient undergoing Surgery as it pertains to a preoperative anaesthetic evaluation	S	SH	Y	DOAP session, Bedside clinic	Skill station			General Surgery, General Medicine

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
AS3.3	Demonstrate and document an appropriate clinical examination in a patient undergoing General Surgery	S	SH	Y	DOAP session, Bedside clinic	Skill station			General Surgery, General Medicine
AS3.4	Choose and interpret appropriate testing for patients undergoing Surgery	S	SH	Y	DOAP session, Bedside clinic	Skill station			General Surgery, General Medicine
AS3.5	Determine the readiness for General Surgery in a patient based on the preoperative evaluation	S	SH	Y	DOAP session, Bedside clinic	Skill station			General Surgery, General Medicine
AS5.6	Observe and describe the principles and steps/ techniques involved in common blocks used in Surgery(including brachial plexus blocks)	S	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce			General Surgery
AS6.3	Describe the common complications encountered by patients in the recovery room, their recognition and principles of management	K	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce			General Surgery
AS9.3	Describe the principles of fluid therapy in the preoperative period	K	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce			General Surgery
AS9.4	Enumerate blood products and describe the use of blood products in the preoperative period	K	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce		Pathology	General Surgery
AS10.3	Describe the role of communication in patient safety	K	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce		AETCOM	General Surgery
General Medicine									
IM5.8	Describe and discuss the pathophysiology, clinical evolution and complications of cholelithiasis and cholecystitis	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
IM5.13	Enumerate the indications for ultrasound and other imaging studies including MRCP and ERCP and describe the findings in liver disease	K	K	Y	Bed side clinic, Small group discussion	Written/ Viva voce		Radiodiagnosis	General Surgery
IM5.16	Describe and discuss the management of hepatitis, cirrhosis, portal hypertension, ascites, spontaneous, bacterial peritonitis and hepatic encephalopathy	K	KH	Y	Written, Small group discussion	Skill assessment/ Written/ Viva voce		Pharmacology	General Surgery
IM5.18	Enumerate the indications for hepatic transplantation	K	K	Y	Written, Small group discussion	Written/ Viva voce			General Surgery
IM12.6	Perform and demonstrate a systematic examination based on the history that will help establish the diagnosis and severity including systemic signs of thyrotoxicosis and hypothyroidism, palpation of the pulse for rate and rhythm abnormalities, neck palpation of the thyroid and lymph nodes and cardiovascular findings	S	SH	Y	Bed side clinic, DOAP session	Skill assessment			General Surgery
IM12.7	Demonstrate the correct technique to palpate the thyroid	S	SH	Y	Bedside clinic, DOAP session	Skill assessment			General Surgery
IM12.8	Generate a differential diagnosis based on the clinical presentation and prioritise it based on the most likely diagnosis	K	KH	Y	Bedside clinic, small group discussion	Short case			General Surgery
IM12.9	Order and interpret diagnostic testing based on the clinical diagnosis including CBC, thyroid function tests and ECG and radio iodine uptake and scan	S	SH	Y	Bed side clinic, DOAP session	Skill assessment			General Surgery
IM12.10	Identify atrial fibrillation, pericardial effusion and bradycardia on ECG	S	SH	Y	Bedside clinic, lab	Skill assessment			General Surgery
IM12.11	Interpret thyroid function tests in hypo-and hyperthyroidism	S	SH	Y	Bedside clinic, lab	Skill assessment			General Surgery
IM12.13	Describe the pharmacology, indications, adverse reaction, interactions of thyroxine and antithyroid drugs	K	KH	Y	Lecture, Small group discussion	Viva voce/ Short note		Pharmacology	General Surgery
IM12.15	Describe and discuss the indications of thionamide therapy, radio iodine therapy and Surgeryin the management of thyrotoxicosis	K	KH	Y	Bedside clinic, Small group discussion	Short note/ Viva voce, Skill assessment		Pharmacology	General Surgery

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
IM13.7	Elicit document and present a history that will help establish the aetiology of cancer and includes the appropriate risk factors, duration and evolution	S	K	Y	Bedside clinic	Skill assessment/ Short case			General Surgery
IM13.8	Perform and demonstrate a physical examination that includes an appropriate general and local examination that excludes the diagnosis, extent spread and complications of cancer	S	SH	Y	Bedside clinic	Skill assessment/ Short case			General Surgery
IM13.9	Demonstrate in a mannequin the correct technique for performing breast exam, rectal examination and cervical examination and pap smear	S	K	Y	Bedside clinic	Skill assessment/ Short case		Human Anatomy	General Surgery
IM13.10	Generate a differential diagnosis based on the presenting symptoms and clinical features and prioritise based on the most likely diagnosis	S	K	Y	Bedside clinic	Skill assessment/ Short case			General Surgery
IM13.13	Describe and assess pain and suffering objectively in a patient with cancer	K	KH	Y	Bedside clinic, Small group discussion	Short note/ Viva voce		Pharmacology	General Surgery
IM13.14	Describe the indications for General Surgery, radiation and chemotherapy for common malignancies	K	KH	Y	Bedside clinic, Small group discussion	Short note/ Viva voce		Pharmacology	General Surgery
IM14.14	Describe and enumerate the indications and side effects of bariatric surgery	K	K	Y	Lecture, Small group discussion	Short note/ Viva voce			General Surgery
IM15.1	Enumerate,describe and discuss the aetiology of upper and lower GI bleeding	K	K	Y	Lecture, Small group discussion	Short note/ Viva voce		Pathology	General Surgery
IM15.2	Enumerate describe and discuss the evaluation and steps involved in stabilizing a patient who presents with acute volume loss and GI bleed	S	SH	Y	DOAP session, Small group discussion, Lecture	Written/ Viva voce/ Skill assessment		Pathology	General Surgery
IM15.3	Describe and discuss the physiologic effects of acute blood and volume loss	K	K	Y	Lecture, Small group discussion	Short note/ Viva voce		Pathology, Physiology	General Surgery
IM15.4	Elicit document and present an appropriate history that identifies the route of bleeding, quantity, grade, volume loss, duration, etiology, comorbid illnesses and risk factors	S	SH	Y	Bedside clinic	Skill assessment			General Surgery

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
IM15.5	Perform, demonstrate and document a physical examination based on the history that includes general examination, volume assessment and appropriate abdominal examination	S	SH	Y	Bedside clinic, Skills lab	Skill assessment			General Surgery
IM15.6	Distinguish between upper and lower gastrointestinal bleeding based on the clinical features	S	KH	Y	Lecture, Small group discussion	Short note/ Viva voce			General Surgery
IM15.7	Demonstrate the correct technique to perform an anal and rectal examination in a mannequin or equivalent	S	SH	Y	DOAP session	Skill assessment			General Surgery
IM15.8	Generate a differential diagnosis based on the presenting symptoms and clinical features and prioritise based on the most likely diagnosis	S	SH	Y	Bedside clinic, Skills lab	Skill assessment/ Short note/ Viva voce			General Surgery
IM15.9	Choose and interpret diagnostic tests based on the clinical diagnosis including complete blood count, PT and PTT, stool examination, occult blood, liver function tests, H.pylori test.	S	SH	Y	Bedside clinic, DOAP session, Small group discussion	Skill assessment/ Short note/ Viva voce		Pathology	General Surgery
IM15.10	Enumerate the indications for endoscopy, colonoscopy and other imaging procedures in the investigation of Upper GI bleeding	K	KH	Y	Lectures, Small group discussion	Written/ Viva voce			General Surgery
IM15.11	Develop, document and present a treatment plan that includes fluid resuscitation, blood and blood component transfusion, and specific therapy for arresting blood loss	S	KH	Y	Lecture, Small group discussion	Short note/ Viva voce		Pathology	General Surgery
IM15.12	Enumerate the indications for whole blood, component and platelet transfusion and describe the clinical features and management of a mismatched transfusion	K	K	Y	Lecture, Small group discussion	Short note/ Viva voce		Pathology	General Surgery
IM15.13	Observe cross matching and blood / blood component transfusion	S	SH	Y	Bedside clinic	Short note/ Viva voce/ Skill assessment		Pathology	General Surgery
IM15.14	Describe and enumerate the indications, pharmacology and side effects of pharmacotherapy of pressors used in the treatment of Upper GI bleed	K	K	Y	Lecture, Small group discussion	Short note/ Viva voce		Pharmacology	General Surgery

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
IM15.15	Describe and enumerate the indications, pharmacology and side effects of pharmacotherapy of acid peptic disease including Helicobacter pylori	K	K	Y	Lecture, Small group discussion	Short note/ Viva voce		Pharmacology, Microbiology	General Surgery
IM15.16	Enumerate the indications for endoscopic interventions and Surgery	K	K	Y	Lecture, Small group discussion	Short note/ Viva voce			General Surgery
IM15.17	Determine appropriate level of specialist consultation	S	K	Y	Small group discussion				General Surgery
IM15.18	Counsel the family and patient in an empathetic non-judgmental manner on the diagnosis and therapeutic options	S	SH	Y	DOAP session	Skill assessment			General Surgery
IM16.12	Enumerate and discuss the indications for further investigations including antibodies, colonoscopy, diagnostic imaging and biopsy in the diagnosis of chronic diarrhea	K	KH	Y	Lectures, Small group discussion	Written/ Viva voce		Pathology	General Surgery
IM16.15	Distinguish, based on the clinical presentation, Crohn’s disease from ulcerative colitis	S	SH	Y	Lecture, Small group discussion	Short note/ Viva voce		Pathology	General Surgery
IM16.17	Describe and enumerate the indications for Surgeryin inflammatory bowel disease	K	K	Y	Lecture, Small group discussion	Short note/ Viva voce			General Surgery
IM18.15	Enumerate the indications for Surgery in a hemorrhagic stroke	K	K	Y	Lecture, Small group discussion	Written/ Viva voce			General Surgery
IM19.9	Enumerate the indications for use of Surgery and botulinum toxin in the treatment of movement disorders	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	General Surgery
IM22.2	Describe the aetiology, clinical manifestations, diagnosis and clinical approach to primary hyperparathyroidism	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Pathology	General Surgery

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
IM24.11	Describe and discuss the aetiopathogenesis,clinical presentation, identification, functional changes, acute care, stabilization, management and rehabilitation of the elderly undergoing surgery	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Anesthesiology, General Surgery
Obstetrics & Gynaecology									
OG26.2	Describe the causes, prevention, clinical features, principles of management of genital injuries and fistulae	K	KH	N	Lecture, Small group discussion	Written/ Viva voce			General Surgery
OG33.2	Describe the principles of management including Surgery and radiotherapy of benign, pre-malignant (CIN) and malignant Lesions of the Cervix	K	KH	Y	Lecture, Small group discussion, Bedside clinics	Written/ Viva voce/ Skill assessment			General Surgery
Pediatrics									
PE21.8	Elicit, document and present a history pertaining to diseases of the Genitourinary tract00	S	SH	Y	Bedside clinics, Skills lab	Skill Assessment			General Surgery
PE21.14	Recognize common surgical conditions of the abdomen and genitourinary system and enumerate the indications for referral including acute and subacute intestinal obstruction, appendicitis pancreatitis perforation intussusception, Phimosis, undescended testis, Chordee, hypospadiasis,Torsion testis, hernia Hydrocele, Vulval Synechiae	S	SH	Y	Bed side clinics, Skills lab	Log book assessment			General Surgery
Orthopedics									
OR1.1	Describe and discuss the principles of pre-hospital care and casuality management of a trauma victim including principles of triage	K/S/A/C	K/KH	Y	Lecture with video, Small group discussion	Written/ Viva voce/ OSCE/ Simulation			General Surgery - Anaesthesiology
OR1.2	Describe and discuss the aetiopathogenesis, clinical features, investigations, and principles of management of shock	K/S	K/KH	Y	Lecture	Written/ Viva voce/ OSCE/ Simulation			General Surgery

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
OR1.3	Describe and discuss the aetiopathogenesis, clinical features, investigations, and principles of management of soft tissue injuries	K	KH/ SH	Y	Lecture, Small group discussion	Written/ OSCE			General Surgery
OR1.4	Describe and discuss the principles of management of soft tissue injuries	K	K/KH	Y	Lecture, Small group discussion	Written Assesment/ Viva voce			General Surgery
OR3.1	Describe and discuss the aetiopathogenesis, clinical features, Investigations and principles of management of Bone and Joint infections a) Acute Osteomyelitis b) Subacute osteomyelitis c) Acute Suppurative arthritis d) Septic arthritis & HIV infection e) Spirochaetal infection f) Skeletal Tuberculosis	K/S	K/KH/ SH	Y	Lecture, Small group discussion, Video assisted lecture	Written/ Viva voce/ OSCE		Pathology, Microbiology	General surgery
OR3.3	Participate as a member in team for procedures like drainage of abscess, sequestrectomy/ saucerisation and arthrotomy	K/S/A/C	SH	Y	DOAP session, Video demonstration	Viva voce/ OSCE/ Skills assessment			General Surgery
OR4.1	Describe and discuss the clinical features, Investigation and principles of management of Tuberculosis affecting major joints (Hip, Knee) including cold abcess and caries spine	K	K/KH	Y	Lecture,Small group discussion, Case discussion	Written/ Viva voce/ OSCE		Pathology	General surgery
OR10.1	Describe and discuss the aetiopathogenesis, clinical features, Investigations and principles of management of benign and malignant bone tumours and pathological fractures	K	K/KH	Y	Lecture, Small group discussion, Video assisted interactive lecture	Written/ Viva voce OSCE		Pathology	General surgery, Radiotherapy
OR11.1	Describe and discuss the aetiopathogenesis, clinical features, investigations and principles of management of peripheral nerve injuries in diseases like foot drop, wrist drop, claw hand, palsies of Radial, Ulnar, Median, Lateral Popliteal and Sciatic Nerves	K	K/H	Y	Lecture Small Group discussion, Case discussion	Written/ Viva voce/ OSCE		Human Anatomy	General Medicine, General surgery
Physical Medicine & Rehabilitation									
PM5.1	Enumerate the indications and describe the principles of amputation	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Orthopedics, General Surgery

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PM7.8	Enumerate the causes of, describe, classify Pressure sores, prevention, and treatment.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			General Surgery
PM7.9	Enumerate the indications of debridement, and Split thickness skin grafting.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			General Surgery
PM8.1	Describe the clinical features, evaluation, diagnosis and management of disability following traumatic brain injury	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			General Medicine, Orthopedics, General Surgery
Radiotherapy									
RT1.1	Describe and discuss definition of radiation, mechanism of action of radiation, types of radiation	K	KH	Y	Lecture	Written/ Viva voce			General Surgery Anaesthesiology
RT1.3	Enumerate, describe and discuss and classify staging of cancer (AJCC, FIGO etc.)	K	KH	Y	Lecture	Written/ Viva voce		Pathology	General Surgery, General Medicine
RT4.5	Describe and discuss role of radiation in management of common malignancies in India (region specific)	K	KH	Y	Lecture, Bed side clinic	Written/ Viva voce		Pathology	General Surgery, Obstetrics & Gynaecology
RT4.6	Describe and discuss radiotherapy for benign disease	K	KH	Y	Lecture	Written/ Viva voce		Pathology	General Surgery, Obstetrics & Gynaecology
RT4.7	Counsel patients regarding acute and late effects of radiation and supportive care	K/A/S	KH	Y	Bedside clinic, Group discussion	Written/ Viva voce		Pathology	General Surgery, Obstetrics & Gynaecology
RT4.8	Describe oncological emergencies and palliative care	K/A/S	K/KH	Y	Lecture, Group discussion	Written/ Viva voce			General Surgery, Obstetrics & Gynaecology
RT5.1	Describe and discuss cancer prevention, screening, vaccination, cancer registry	K	K	Y	Group discussion	Written/ Viva voce		Pathology	General Surgery, Obstetrics & Gynaecology

OPHTHALMOLOGY (CODE: OP)

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
OPHTHALMOLOGY									
Topic: Visual Acuity Assessment		**Number of Competencs: (05)**				**Number of procedures that require certification : (NIL)**			
OP1.1	Describe the physiology of vision	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology	
OP1.2	Define, classify and describe the types and methods of correcting refractive errors	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
OP1.3	Demonstrate the steps in performing the visual acuity assessment for distance vision, near vision, colour vision, the pin hole test and the menace and blink reflexes	S	SH	Y	DOAP session, Lecture	Skill assessment/ Logbook			
OP1.4	Enumerate the indications and describe the principles of refractive surgery	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
OP1.5	Define, enumerate the types and the mechanism by which strabismus leads to amblyopia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
Topic: Lids and Adnexa, Orbit		**Number of Competencies: (08)**				**Number of procedures that require certification: (NIL)**			
OP2.1	Enumerate the causes, describe and discuss the aetiology, clinical presentations and diagnostic features of common conditions of the lid and adnexa including Hordeolum externum/ internum, blepharitis, preseptal cellulitis, dacryocystitis, hemangioma, dermoid, ptosis, entropion, lid lag, lagopthalmos	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy	
OP2.2	Demonstrate the symptoms & clinical signs of conditions enumerated in OP2.1	S	S	Y	DOAP session	Skill assessment			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
OP2.3	Demonstrate under supervision clinical procedures performed in the lid including: bells phenomenon, assessment of entropion/ ectropion, perform the regurgitation test of lacrimal sac. massage technique in cong. dacryocystitis, and trichiatic cilia removal by epilation	S	SH	Y	DOAP session, Lecture	Skill assessment			
OP2.4	Describe the aetiology, clinical presentation. Discuss the complications and management of orbital cellulitis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
OP2.5	Describe the clinical features on ocular examination and management of a patient with cavernous sinus thrombosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
OP2.6	Enumerate the causes and describe the differentiating features, and clinical features and management of proptosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
OP2.7	Classify the various types of orbital tumours. Differentiate the symptoms and signs of the presentation of various types of ocular tumours	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
OP2.8	List the investigations helpful in diagnosis of orbital tumors. Enumerate the indications for appropriate referral	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
Topic: Conjunctiva		**Number of Competencies (09)**			**Number of procedures that require certification: (NIL)**				
OP3.1	Elicit document and present an appropriate history in a patient presenting with a “red eye” including congestion, discharge, pain	S	SH	Y	DOAP session	Skill Assessment			
OP3.2	Demonstrate document and present the correct method of examination of a “red eye” including vision assessment, corneal lustre, pupil abnormality, ciliary tenderness	S	SH	Y	DOAP session	Skill Assessment			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
OP3.3	Describe the aetiology, pathophysiology, ocular features, differential diagnosis, complications. and management of various causes of conjunctivitis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
OP3.4	Describe the aetiology, pathophysiology, ocular features, differential diagnosis, complications and management of trachoma.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
OP3.5	Describe the aetiology, pathophysiology, ocular features, differential diagnosis, complications and management of vernal catarrh	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
OP3.6	Describe the aetiology, pathophysiology, ocular features, differential diagnosis, complications and management of pterygium	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
OP3.7	Describe the aetiology, pathophysiology, ocular features, differential diagnosis, complications and management of symblepharon	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
OP3.8	Demonstrate correct technique of removal of foreign body from the eye in a simulated environment	S	SH	Y	DOAP session	Skill assessment			
OP3.9	Demonstrate the correct technique of instillation of eye drops in a simulated environment	S	SH	Y	DOAP session	Skill assessment			
Topic: Corneas		**Number of Competencies: (10)**				**Number of procedures that require certification: (NIL)**			
OP4.1	Enumerate, describe and discuss the types and causes of corneal ulceration	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy	
OP4.2	Enumerate and discuss the differential diagnosis of infective keratitis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
OP4.3	Enumerate the causes of corneal edema	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
OP4.4	Enumerate the causes and discuss the management of dry eye	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
OP4.5	Enumerate the causes of corneal blindness	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
OP4.6	Enumerate the indications and the types of keratoplasty	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
OP4.7	Enumerate the indications and describe the methods of tarsorraphy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
OP4.8	Demonstrate technique of removal of foreign body in the cornea in a simulated environment	S	SH	Y	DOAP session	Skill assessment			
OP4.9	Describe and discuss the importance and protocols involved in eye donation and eye banking	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
OP4.10	Counsel patients and family about eye donation in a simulated environment	A/C	SH	Y	DOAP session	Skill assessment			
Topic: Sclera		**Number of competencies: (02)**				**Number of procedures that require certification : (NIL)**			
OP5.1	Define, enumerate and describe the aetiology, associated systemic conditions, clinical features complications indications for referral and management of episcleritis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
OP5.2	Define, enumerate and describe the aetiology, associated systemic conditions, clinical features, complications, indications for referral and management of scleritis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
Topic: Iris and Anterior chamber		**Number of Competencies (10)**			**Number of procedures that require certification: (NIL)**				
OP6.1	Describe clinical signs of intraocular inflammation and enumerate the features that distinguish granulomatous from non-granulomatous inflammation. Identify acute iridocyclitis from chronic condition	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
OP6.2	Identify and distinguish acute iridocyclitis from chronic iridocyclitis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
OP6.3	Enumerate systemic conditions that can present as iridocyclitis and describe their ocular manifestations	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			General Medicine
OP6.4	Describe and distinguish hyphema and hypopyon	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
OP6.5	Describe and discuss the angle of the anterior chamber and its clinical correlates	K	KH		Lecture, Small group discussion	Written/ Viva voce			
OP6.6	Identify and demonstrate the clinical features and distinguish and diagnose common clinical conditions affecting the anterior chamber	S	SH	Y	DOAP session, Bedside clinic	Skill assessment			
OP6.7	Enumerate and discuss the aetiology, the clinical distinguishing features of various glaucomas associated with shallow and deep anterior chamber. Choose appropriate investigations and treatment for patients with above conditions.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
OP6.8	Enumerate and choose the appropriate investigation for patients with conditions affecting the Uvea	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
OP6.9	Choose the correct local and systemic therapy for conditions of the anterior chamber and enumerate their indications, adverse events and interactions	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
OP6.10	Counsel patients with conditions of the iris and anterior chamber about their diagnosis, therapy and prognosis in an empathetic manner in a simulated environment	A/C	SH	Y	DOAP session	Skill assessment			
Topic: Lens		**Number of Competencies: (06)**				**Number of procedures that require certification: (NIL)**			
OP7.1	Describe the surgical anatomy and the metabolism of the lens	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, Human Anatomy	
OP7.2	Describe and discuss the aetio-pathogenesis, stages of maturation and complications of cataract	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology	
OP7.3	Demonstrate the correct technique of ocular examination in a patient with a cataract	S	SH	Y	DOAP session	Skill assessment			
OP7.4	Enumerate the types of cataract surgery and describe the steps, intra-operative and post-operative complications of extracapsular cataract extraction surgery.	S	KH	Y	DOAP session, Lecture, Small group discussion	Written/ Viva voce			
OP7.5	To participate in the team for cataract surgery	S	SH	Y	DOAP session	Skill assessment/ Logbook documentation			
OP7.6	Administer informed consent and counsel patients for cataract surgery in a simulated environment	S	SH	Y	DOAP session	Skill Assessment			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
Topic: Retina & optic Nerve		**Number of Competencies (05)**			**Number of procedures that require certification : (NIL)**				
OP8.1	Discuss the aetiology, pathology, clinical features and management of vascular occlusions of the retina	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy, Pathology	
OP8.2	Enumerate the indications for laser therapy in the treatment of retinal diseases (including retinal detachment, retinal degenerations, diabetic retinopathy & hypertensive retinopathy)	K	K	Y	Lecture, Small group discussion	Written/ Viva voce			
OP8.3	Demonstrate the correct technique of a fundus examination and describe and distinguish the funduscopic features in a normal condition and in conditions causing an abnormal retinal exam	S	SH	Y	Lecture, Small group discussion	Skill Assessment			
OP8.4	Enumerate and discuss treatment modalities in management of diseases of the retina	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
OP8.5	Describe and discuss the correlative anatomy, aetiology, clinical manifestations, diagnostic tests, imaging and management of diseases of the optic nerve and visual pathway	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
Topic: Miscellaneous		**Number of Competencies (05)**			**Number of procedures that require certification: (01)**				
OP9.1	Demonstrate the correct technique to examine extra ocular movements (Uniocular & Binocular)	S	P	Y	DOAP session	Skill Assessment	5		
OP9.2	Classify, enumerate the types, methods of diagnosis and indications for referral in a patient with heterotropia/ strabismus	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce/ skill assessment			
OP9.3	Describe the role of refractive error correction in a patient with headache and enumerate the indications for referral	K	K	Y	Lecture, Small group discussion	Written/ Viva voce			General Medicine

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
OP9.4	Enumerate, describe and discuss the causes of avoidable blindness and the National Programs for Control of Blindness (including vision 2020)	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Community Medicine
OP9.5	Describe the evaluation and enumerate the steps involved in the stabilisation, initial management and indication for referral in a patient with ocular injury	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			

Column C: K- Knowledge, S – Skill, A - Attitude / professionalism, C- Communication.
Column D: K – Knows, KH - Knows How, SH - Shows how, P- performs independently,
Column F: DOAP session – Demonstrate, Observe, Assess, Perform.
Column H: If entry is P: indicate how many procedures must be done independently for certification/ graduation

Integration

Human Anatomy

AN30.5	Explain effect of pituitary tumours on visual pathway	K	KH	N	Lecture	Written		Ophthalmology	
AN31.3	Describe anatomical basis of Horner's syndrome	K	KH	N	Lecture	Written		Ophthalmology	
AN31.5	Explain the anatomical basis of oculomotor, trochlear and abducent nerve palsies along with strabismus	K	KH	Y	Lecture	Written		Ophthalmology	
AN41.1	Describe & demonstrate parts and layers of eyeball	K/S	SH	Y	Practical, Lecture, Small group discussion	Written/ Viva voce		Ophthalmology	
AN41.2	Describe the anatomical aspects of cataract, glaucoma & central retinal artery occlusion	K	KH	N	Lecture	Written		Ophthalmology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
AN41.3	Describe the position, nerve supply and actions of intraocular muscles	K	KH	N	Lecture	Written		Ophthalmology	
	Physiology								
PY10.17	Describe and discuss functional anatomy of eye, physiology of image formation, physiology of vision including colour vision, Refractive errors, colour blindness, Physiology of pupil and light reflex	K	KH	Y	Lecture, Small group discussion	Written/viva		Ophthalmology	
PY10.18	Describe and discuss the physiological basis of lesion in visual pathway	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Ophthalmology	
PY10.19	Describe and discuss auditory & visual evoke potentials	K	KH	Y	Lecture, Small group discussion	Written/ viva		Ophthalmology	
PY10.20	Demonstrate testing of visual acuity, colour and field of vision in volunteer/ simulated environment	S	P	Y	DOAP sessions	Skill assessment/ Viva voce	1	ENT, Ophthalmology	
	Pathology								
PA36.1	Describe the etiology, genetics, pathogenesis, pathology, presentation, sequelae and complications of retinoblastoma	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Ophthalmology	
	Pharmacology								
PH1.58	Describe drugs used in Ocular disorders	K	KH	Y	Lecture	Written/ Viva voce		Ophthalmology	
	General Medicine								
IM24.15	Describe and discuss the aetiopathogenesis, clinical presentation, identification, functional changes, acute care, stabilization, management and rehabilitation of vision and visual loss in the elderly	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Ophthalmology

OTORHINOLARYNGOLOGY (ENT) (CODE: EN)

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
OTORHINOLARYNGOLOGY (ENT)									
Topic: Anatomy and Physiology of ear, nose, throat, head & neck		**Number of competencies:(02)**				**Number of procedures that require certification:(NIL)**			
EN1.1	Describe the Anatomy & physiology of ear, nose, throat, head & neck	K	KH	Y	Lecture, Small group discussion, Demonstration	Written/ Viva voce/ Skill assessment		Human Anatomy	
EN1.2	Describe the pathophysiology of common diseases in ENT	K	KH	Y	Lecture, Small group discussion, Demonstration	Written/ Viva voce/ Skill assessment		Pathology	
Topic: Clinical Skills		**Number of competencies: (15)**				**Number of procedures that require certification : (NIL)**			
EN2.1	Elicit document and present an appropriate history in a patient presenting with an ENT complaint	K/S/A/C	SH	Y	Lecture, Small group discussion, Demonstration	Skill assessment			
EN2.2	Demonstrate the correct use of a headlamp in the examination of the ear, nose and throat	S	SH	Y	DOAP session	Skill assessment/ OSCE			
EN2.3	Demonstrate the correct technique of examination of the ear including Otoscopy	K/S/A	SH	Y	DOAP session, Bedside clinic	Skill assessment/ OSCE			
EN2.4	Demonstrate the correct technique of performance and interpret tuning fork tests	K/S/A	SH	Y	DOAP session, Bedside clinic	Skill assessment/ OSCE			
EN2.5	Demonstrate the correct technique of examination of the nose & paranasal sinuses including the use of nasal speculum	S	SH	Y	DOAP session, Bedside clinic	Skill assessment/ OSCE			
EN2.6	Demonstrate the correct technique of examining the throat including the use of a tongue depressor	S	SH	Y	DOAP session, Bedside clinic	Skill assessment/ OSCE			
EN2.7	Demonstrate the correct technique of examination of neck including elicitation of laryngeal crepitus	S	SH	Y	DOAP session, Bedside clinic	Skill assessment			

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
EN2.8	Demonstrate the correct technique to perform and interpret pure tone audiogram & impedance audiogram	K/S	SH	Y	DOAP session, Bedside clinic	Skill assessment			
EN2.9	Choose correctly and interpret radiological, microbiological & histological investigations relevant to the ENT disorders	K/S	SH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce/ Skill assessment			
EN2.10	Identify and describe the use of common instruments used in ENT surgery	K	SH	Y	DOAP session, Bedside clinic	Skill assessment			
EN2.11	Describe and identify by clinical examination malignant & pre- malignant ENT diseases	K/S	SH	Y	Lecture, Small group discussion, Demonstration	Written/ Viva voce/ Skill assessment			
EN2.12	Counsel and administer informed consent to patients and their families in a simulated environment	S/A/C	SH	Y	DOAP session, Bedside clinic	Skill assessment			
EN2.13	Identify, resuscitate and manage ENT emergencies in a simulated environment (including tracheostomy, anterior nasal packing, removal of foreign bodies in ear, nose, throat and upper respiratory tract)	K/S/A	SH	Y	DOAP session, Bedside clinic	Skill assessment			
EN2.14	Demonstrate the correct technique to instilling topical medications into the ear, nose and throat in a simulated environment	K/S	SH	Y	DOAP session, Bedside clinic	Skill assessment/ OSCE			
EN2.15	Describe the national programs for prevention of deafness, cancer, noise & environmental pollution	K	KH	Y	Lecture, Small group discussion, Demonstration	Written/ Viva voce			
Topic: Diagnostic and Therapeutic procedures in ENT		**Number of competencies:(06)**			**Number of procedures that require certification:(NIL)**				
EN3.1	Observe and describe the indications for and steps involved in the performance of Otomicroscopic examination in a simulated environment	S	KH	N	Lecture, Small group discussion, Demonstration	Written/ Viva voce			

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
EN3.2	Observe and describe the indications for and steps involved in the performance of diagnostic nasal Endoscopy	S	KH	N	Lecture, Small group discussion, Demonstration	Written/ Viva voce			
EN3.3	Observe and describe the indications for and steps involved in the performance of Rigid/Flexible Laryngoscopy	K	KH	N	Lecture, Small group discussion, Demonstration	Written/ Viva voce			
EN3.4	Observe and describe the indications for and steps involved in the removal of foreign bodies from ear, nose & throat	K	KH	N	Lecture, Small group discussion, Demonstration	Written/ Viva voce			
EN3.5	Observe and describe the indications for and steps involved in the surgical procedures in ear, nose & throat	K	KH	N	Lecture, small group discussion, Demonstration	Written/ Viva voce			
EN3.6	Observe and describe the indications for and steps involved in the skills of emergency procedures in ear, nose & throat	K	KH	N	Lecture, Small group discussion, Demonstration	Written/ Viva voce			
Topic: Management of diseases of ear, nose & throat		**Number of competencies: (53)**				**Number of procedures that require certification : (NIL)**			
EN4.1	Elicit document and present a correct history, demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of Otalgia	K/S	SH	Y	Lecture, Small group discussion, DOAP session, Bedside clinic	Written/ Viva voce/ Skill assessment			
EN4.2	Elicit document and present a correct history, demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of diseases of the external Ear	K/S	SH	Y	Lecture, Small group discussion, DOAP session, Bedside clinic	Written/ Viva voce/ Skill assessment			
EN4.3	Elicit document and present a correct history, demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of ASOM	K/S	SH	Y	Lecture, Small group discussion, DOAP session, Bedside clinic	Written/ Viva voce/ Skill assessment			

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
EN4.4	Demonstrate the correct technique to hold visualize and assess the mobility of the tympanic membrane and its mobility and interpret and diagrammatically represent the findings	K/S/A	SH	Y	Clinical, Demonstration	Written/ Viva voce/ Skill assessment			
EN4.5	Elicit document and present a correct history, demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of OME	K/S	SH	Y	Lecture, Small group discussion, DOAP session, Bedside clinic	Written/ Viva voce/ Skill assessment			
EN4.6	Elicit document and present a correct history, demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of Discharging ear	K/S	SH	Y	Lecture, Small group discussion, DOAP session, Bedside clinic	Written/ Viva voce/ Skill assessment			
EN4.7	Elicit document and present a correct history demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of CSOM	K/S	SH	Y	Lecture, Small group discussion, DOAP session, Bedside clinic	Written/ Viva voce/ Skill assessment			
EN4.8	Elicit document and present a correct history, demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of squamosal type of CSOM	K/S	SH	Y	Lecture, Small group discussion, DOAP session, Bedside clinic	Written/ Viva voce/ Skill assessment			
EN4.9	Demonstrate the correct technique for syringing wax from the ear in a simulated environment	S	SH	Y	DOAP session	Skill assessment			
EN4.10	Observe and describe the indications for and steps involved in myringotomy and myringoplasty	S	KH	Y	DOAP session	Written/ Viva voce			
EN4.11	Enumerate the indications describe the steps and observe a mastoidectomy	K/S	KH	Y	DOAP session	Written/ Viva voce			
EN4.12	Elicit document and present a correct history demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of Hearing loss	K/S	SH	Y	Lecture, Small group discussion, DOAP session, Bedside clinic	Written/ Viva voce/ Skill assessment			

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
EN4.13	Describe the clinical features, investigations and principles of management of Otosclerosis	K	KH	Y	Lecture, Small group discussion; Demonstration	Written/ Viva voce/ Skill assessment			
EN4.14	Describe the clinical features, investigations and principles of management of Sudden Sensorineural Hearing Loss	K	KH	Y	Lecture, Small group discussion, Demonstration	Written/ Viva voce/ Skill assessment			
EN4.15	Describe the clinical features, investigations and principles of management of Noise Induced Hearing Loss	K	KH	Y	Lecture, Small group discussion, Demonstration	Written/ Viva voce/ Skill assessment			
EN4.16	Observe and describe the indications for and steps involved in the performance of pure tone audiometry	S	KH	Y	DOAP session	Written/ Viva			
EN4.17	Enumerate the indications and interpret the results of an audiogram	S	SH	Y	DOAP session	Skill assessment			
EN4.18	Describe the clinical features, investigations and principles of management of Facial Nerve palsy	K	KH	Y	Lecture, Small group discussion, Demonstration	Written/ Viva voce/ Skill assessment			
EN4.19	Describe the clinical features, investigations and principles of management of Vertigo	K	KH	Y	Lecture, Small group discussion, Demonstration	Written/ Viva voce/ Skill assessment			
EN4.20	Describe the clinical features, investigations and principles of management of Meniere's Disease	K	KH	N	Lecture, Small group discussion, Demonstration	Written/ Viva voce/ Skill assessment			
EN4.21	Describe the clinical features, investigations and principles of management of Tinnitus	K	KH	Y	Lecture, Small group discussion, Demonstration	Written/ Viva voce/ Skill assessment			
EN4.22	Elicit document and present a correct history demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of squamosal type of Nasal Obstruction	K/S	SH	Y	Lecture, Small group discussion, Demonstration	Written/ Viva voce/ Skill assessment			

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
EN4.23	Describe the clinical features, investigations and principles of management of DNS	K	KH	Y	Lecture, Small group discussion, Demonstration	Written/ Viva voce/ Skill assessment			
EN4.24	Enumerate the indications observe and describe the steps in a septoplasty	S	KH	Y	DOAP session	Written/ Viva voce			
EN4.25	Elicit document and present a correct history, demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of squamosal type of Nasal Polyps	K/S	SH	Y	Lecture, Small group discussion, DOAP session, Bedside clinic	Written/ Viva voce/ Skill assessment			
EN4.26	Elicit document and present a correct history, demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of squamosal type of Adenoids	K/S	SH	Y	Lecture, Small group discussion, DOAP session, Bedside clinic	Written/ Viva voce/ Skill assessment			
EN4.27	Elicit document and present a correct history, demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of squamosal type of Allergic Rhinitis	K/S	SH	Y	Lecture, Small group discussion, DOAP session, Bedside clinic	Written/ Viva voce/ Skill assessment			
EN4.28	Elicit document and present a correct history, demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of squamosal type of Vasomotor Rhinitis	K/S	SH	Y	Lecture, Small group discussion, DOAP session, Bedside clinic	Written/ Viva voce/ Skill assessment			
EN4.29	Elicit, document and present a correct history, demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of squamosal type of Acute & Chronic Rhinitis	K/S	SH	Y	Lecture, Small group discussion, DOAP session, Bedside clinic	Written/ Viva voce/ Skill assessment			
EN4.30	Elicit document and present a correct history, demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of squamosal type of Epistaxis	K/S	SH	Y	Lecture, Small group discussion, DOAP session, Bedside clinic	Written/ Viva voce/ Skill assessment			

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
EN4.31	Describe the clinical features, investigations and principles of management of trauma to the face & neck	K/S	KH	N	Lecture, Small group discussion, Demonstration	Written/ Viva voce			
EN4.32	Describe the clinical features, investigations and principles of management of nasopharyngeal Angiofibroma	K	KH	Y	Lecture, Small group discussion, Demonstration	Written/ Viva voce			
EN4.33	Elicit document and present a correct history demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of squamosal type of Acute & Chronic Sinusitis	K/S	SH	Y	Lecture, Small group discussion, Demonstration	Written/ Viva voce/ Skill assessment			
EN4.34	Describe the clinical features, investigations and principles of management of Tumors of Maxilla	K	KH	Y	Lecture, Small group discussion, Demonstration	Written/ Viva voce			
EN4.35	Describe the clinical features, investigations and principles of management of Tumors of Nasopharynx	K	KH	N	Lecture, Small group discussion, Demonstration	Written/ Viva voce/ Skill assessment			
EN4.36	Describe the clinical features, investigations and principles of management of diseases of the Salivary glands	K	KH	N	Lecture, Small group discussion, Demonstration	Written/ Viva voce/ Skill assessment			
EN4.37	Describe the clinical features, investigations and principles of management of Ludwig's angina	K	KH	Y	Lecture, Small group discussion, Demonstration	Written/ Viva voce/ Skill assessment			
EN4.38	Elicit document and present a correct history demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of type of dysphagia	K/S	SH	Y	Lecture, Small group discussion, Demonstration	Written/ Viva voce/ Skill assessment			
EN4.39	Elicit document and present a correct history, demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of squamosal type of Acute & Chronic Tonsillitis	K/S	SH	Y	Lecture, Small group discussion, DOAP session, Bedside clinic	Written/ Viva voce/ Skill assessment			

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
EN4.40	Observe and describe the indications for and steps involved in a tonsillectomy / adenoidectomy	S	KH	Y	DOAP session	Written/ Viva voce			
EN4.41	Describe the clinical features, investigations and principles of management of Acute & chronic abscesses in relation to Pharynx	K/S	KH	Y	Lecture, Small group discussion Demonstration	Written/ Viva voce			
EN4.42	Elicit, document and present a correct history, demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of hoarseness of voice	K/S	SH	Y	Lecture, Small group discussion, DOAP session, Bedside clinic	Written/ Viva voce/ Skill assessment			
EN4.43	Describe the clinical features, investigations and principles of management of Acute & Chronic Laryngitis	K	KH	Y	Lecture, Small group discussion, Demonstration	Written/ Viva voce			
EN4.44	Describe the clinical features, investigations and principles of management of Benign lesions of the vocal cord	K	KH	Y	Lecture, Small group discussion, Demonstration	Written/ Viva voce			
EN4.45	Describe the clinical features, investigations and principles of management of Vocal cord palsy	K	KH	N	Lecture, Small group discussion, Demonstration	Written/ Viva voce/ Skill assessment			
EN4.46	Describe the clinical features, investigations and principles of management of Malignancy of the Larynx & Hypopharynx	K	KH	Y	Lecture, Small group discussion, Demonstration	Written/ Viva voce/ Skill assessment			
EN4.47	Describe the clinical features, investigations and principles of management of Stridor	K	KH	Y	Lecture, Small group discussion Demonstration	Written/ Viva voce/ Skill assessment			
EN4.48	Elicit document and present a correct history, demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of Airway Emergencies	S	SH	Y	Lecture, Small group discussion, Demonstration	Written/ Viva voce/ Skill assessment			

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
EN4.49	Elicit document and present a correct history, demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of foreign bodies in the air & food passages	S	SH	Y	Lecture, Small group discussion, Demonstration	Written/ Viva voce/ Skill assessment			
EN4.50	Observe and describe the indications for and steps involved in tracheostomy	S	KH	Y	DOAP session	Written/ Viva voce			
EN4.51	Observe and describe the care of the patient with a tracheostomy	S	KH	Y	DOAP session	Written/ Viva voce			
EN4.52	Describe the Clinical features, Investigations and principles of management of diseases of Oesophagus	K	ENT	N	Lecture, Small group discussion, Demonstration	Written/ Viva voce/ Skill assessment			
EN4.53	Describe the clinical features, investigations and principles of management of HIV manifestations of the ENT	K	KH	N	Lecture, Small group discussion, Demonstration	Written/ Viva voce/ Skill assessment		General Medicine	
	Column C: K- Knowledge, S – Skill, A - Attitude / professionalism, C- Communication. **Column D: K – Knows, KH - Knows How, SH - Shows how, P- performs independently,** **Column F: DOAP session – Demonstrate, Observe, Assess, Perform.** **Column H: If entry is P: indicate how many procedures must be done independently for certification/ graduation**								
Integration									
	Human Anatomy								
AN36.1	Describe the (1) morphology, relations, blood supply and applied anatomy of palatine tonsil and (2) composition of soft palate	K	KH	Y	Lecture	Written		ENT	
AN36.2	Describe the components and functions of waldeyer's lymphatic ring	K	KH	Y	Lecture	Written		ENT	
AN36.3	Describe the boundaries and clinical significance of pyriform fossa	K	KH	N	Lecture	Written		ENT	
AN36.4	Describe the anatomical basis of tonsilitis, tonsillectomy, adenoids and peri-tonsillar abscess	K	KH	N	Lecture	Written		ENT	

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
AN36.5	Describe the clinical significance of Killian's dehiscence	K	KH	N	Lecture	Written		ENT	
AN37.1	Describe & demonstrate features of nasal septum, lateral wall of nose, their blood supply and nerve supply	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		ENT	
AN37.2	Describe location and functional anatomy of paranasal sinuses	K	KH	Y	Lecture	Written		ENT	
AN37.3	Describe anatomical basis of sinusitis & maxillary sinus tumours	K	KH	N	Lecture	Written		ENT	
AN38.1	Describe the morphology, identify structure of the wall, nerve supply, blood supply and actions of intrinsic and extrinsic muscles of the larynx	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		ENT	
AN38.2	Describe the anatomical aspects of laryngitis	K	KH	N	Lecture	Written		ENT	
AN38.3	Describe anatomical basis of recurrent laryngeal nerve injury	K	KH	N	Lecture	Written		ENT	
AN39.2	Explain the anatomical basis of hypoglossal nerve palsy	K	KH	N	Lecture	Written		ENT	
AN40.1	Describe & identify the parts, blood supply and nerve supply of external ear	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		ENT	
AN40.2	Describe & demonstrate the boundaries, contents, relations and functional anatomy of middle ear and auditory tube	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		ENT	
AN40.3	Describe the features of internal ear	K	KH	N	Lecture	Written		ENT	

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
AN40.4	Explain anatomical basis of otitis externa and otitis media	K	KH	N	Lecture	Written		ENT	
AN40.5	Explain anatomical basis of myringotomy	K	KH	N	Lecture	Written		ENT	
Physiology									
PY10.13	Describe and discuss perception of smell and taste sensation	K	KH	Y	Lecture, Small group discussion	Written /Viva voce		ENT	
PY10.15	Describe and discuss functional anatomy of ear and auditory pathways & physiology of hearing	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		ENT	
PY10.16	Describe and discuss pathophysiology of deafness. Describe hearing tests	K	KH	Y	Lecture, Small group discussion	Written /Viva voce		ENT	
PY10.20	Demonstrate (i) hearing (ii) testing for smell and (iii) taste sensation in volunteer/ simulated environment	S	P	Y	DOAP sessions	Skill assessment/ Viva voce	1 each x 3	ENT, Ophthalmology	
Community Medicine									
CM3.1	Describe the health hazards of air, water, noise, radiation and pollution.	K	KH	Y	Lecture, small group discussion	Written/ Viva voce		General Medicine, ENT	
Dentistry									
DE4.1	Discuss the prevalence of oral cancer and enumerate the common types of cancer that can affect tissues of the oral cavity	K	K	N	Lecture	Viva voce		Pathology	ENT
DE4.2	Discuss the role of etiological factors in the formation of precancerous /cancerous lesions	K	KH	Y	Lecture, Small group discussion	Viva voce		Pathology	ENT
DE4.3	Identify potential pre-cancerous /cancerous lesions	S	SH	N	Observation, Bed side clinics	Skill assessment		Pathology	ENT

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
DE4.4	Counsel patients to risks of oral cancer with respect to tobacco, smoking, alcohol and other causative factors	A/C	SH	Y	DOAP session	Document in Log book	2	Pathology	ENT
General Medicine									
IM24.17	Describe and discuss the aetiopathogenesis, clinical presentation, identification, functional changes, acute care, stabilization, management and rehabilitation of hearing loss in the elderly	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			ENT
Pediatrics									
PE14.2	Discuss the risk factors, clinical features, Diagnosis and management of Kerosene ingestion	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		ENT	
PE28.1	Discuss the etio-pathogenesis, clinical features and management of Naso pharyngitis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		ENT	
PE28.2	Discuss the etio-pathogenesis of Pharyngo Tonsillitis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		ENT	
PE28.3	Discuss the clinical features and management of Pharyngo Tonsillitis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		ENT	
PE28.4	Discuss the etio-pathogenesis, clinical features and management of Acute Otitis Media (AOM)	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		ENT	
PE28.5	Discuss the etio-pathogenesis, clinical features and management of Epiglottitis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		ENT	
PE28.6	Discuss the etio-pathogenesis, clinical features and management of Acute laryngo- trachea-bronchitis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		ENT	
PE28.7	Discuss the etiology, clinical features and management of Stridor in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		ENT	
PE28.8	Discuss the types, clinical presentation, and management of foreign body aspiration in infants and children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		ENT	

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PE28.9	Elicit, document and present age appropriate history of a child with upper respiratory problem including Stridor	S	SH	Y	Bedside clinics, skill lab	Skill Assessment		ENT	
PE28.10	Perform otoscopic examination of the ear	S	SH	Y	DOAP session	Skill Assessment		ENT	
PE28.11	Perform throat examination using tongue depressor	S	SH	Y	DOAP session	Skill Assessment		ENT	
PE28.12	Perform examination of the nose	S	P	Y	DOAP session	Skill Assessment		ENT	
PE28.17	Interpret X-ray of the paranasal sinuses and mastoid; and /or use written report in case of management. Interpret CXR in foreign body aspiration and lower respiratory tract infection, understand the significance of thymic shadow in pediatric chest X-rays	S	P	Y	Bedside clinics, Small group discussion	Skills Assessment	3	ENT, Radiodiagnosis	
PE31.1	Describe the etio-pathogenesis, management and prevention of Allergic Rhinitis in Children	K	KH	Y	Lecture Small group discussion	Written/ Viva voce		ENT	
PE31.3	Describe the etio-pathogenesis, clinical features and management of Atopic dermatitis in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		ENT	
General Surgery									
SU20.1	Describe etiopathogenesis of oral cancer, symptoms and signs of pharyngeal cancer. Enumerate the appropriate investigations and discuss the principles of treatment.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		ENT	

OBSTETRICS & GYNECOLOGY (CODE: OG)

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
OBSTETRICS & GYNAECOLOGY									
Topic: Demographic and Vital Statistics **Number of competencies: (03)** **Number of procedures that require certification : (NIL)**									
OG1.1	Define and discuss birth rate, maternal mortality and morbidity	K	KH	Y	Lecture, Small group discussion	Short notes		Community Medicine	
OG1.2	Define and discuss perinatal mortality and morbidity including perinatal and neonatal mortality and morbidity audit	K	KH	Y	Lecture, Small group discussion	Short notes		Community Medicine	Pediatrics
OG1.3	Define and discuss still birth and abortion	K	KH	Y	Lecture, Small group discussion	Short notes		Forensic Medicine & Toxicology	
Topic: Anatomy of the female reproductive tract (Basic anatomy and embryology) **Number of competencies: (01)** **Number of procedures that require certification : (NIL)**									
OG2.1	Describe and discuss the development and anatomy of the female reproductive tract, relationship to other pelvic organs, applied anatomy as related to Obstetrics and Gynaecology.	K	KH	Y	Lecture, Small group discussion	Theory/ Skill station		Human Anatomy	
Topic: Physiology of conception **Number of competencies: (01)** **Number of procedures that require certification : (NIL)**									
OG3.1	Describe the physiology of ovulation, menstruation, fertilization, implantation and gametogenesis.	K	K	Y	Lecture, seminars	Theory		Physiology	
Topic: Development of the fetus and the placenta **Number of competencies: (01)** **Number of procedures that require certification : (NIL)**									
OG4.1	Describe and discuss the basic embryology of fetus, factors influencing fetal growth and development, anatomy and physiology of placenta, and teratogenesis	K	K	Y	Lecture, Small group discussion	Theory		Human Anatomy	

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
Topic: Preconception counselling		**Number of competencies:(02)**				**Number of procedures that require certification : (NIL)**			
OG5.1	Describe, discuss and identify pre-existing medical disorders and discuss their management; discuss evidence-based intrapartum care	K/S	SH	Y	Lecture, Bedside clinics	Theory/ clinical assessment			
OG5.2	Determine maternal high risk factors and verify immunization status	K/S	SH	Y	Lecture, Bedside clinics	Theory/ clinical assessment			
Topic: Diagnosis of pregnancy		**Number of competencies:(01)**				**Number of procedures that require certification : (NIL)**			
OG6.1	Describe, discuss and demonstrate the clinical features of pregnancy, derive and discuss its differential diagnosis, elaborate the principles underlying and interpret pregnancy tests.	S	SH	Y	Lecture, Small group discussion, Bedside clinics	Theory/ Clinical assessment/ Viva voce			
Topic: Maternal Changes in pregnancy		**Number of competencies: (01)**				**Number of procedures that require certification : (NIL)**			
OG7.1	Describe and discuss the changes in the genital tract, cardiovascular system, respiratory, haematology, renal and gastrointestinal system in pregnancy	K	KH	Y	Lecture, seminars	Theory		Physiology	
Topic: Antenatal Care		**Number of competencies: (08)**				**Number of procedures that require certification : (NIL)**			
OG8.1	Enumerate, describe and discuss the objectives of antenatal care, assessment of period of gestation; screening for high-risk factors.	K	KH	Y	Small group discussion, Bedside clinics, Lecture	Written/ Viva voce/ Skill assessment		Community Medicine	
OG8.2	Elicit document and present an obstetric history including menstrual history, last menstrual period, previous obstetric history, comorbid conditions, past medical history and surgical history	K/S	SH	Y	Small group discussion, Bedside clinics, Lecture	Written/ Viva voce/ Skill assessment			

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
OG8.3	Describe, demonstrate, document and perform an obstetrical examination including a general and abdominal examination and clinical monitoring of maternal and fetal well-being;	K/S	SH	Y	Bed side clinic, DOAP session	Skill assessment			
OG8.4	Describe and demonstrate clinical monitoring of maternal and fetal well-being	K/S	SH	Y	Bedside clinic, DOAP session, Small group discussion	Skill assessment/ Written/ Viva voce			
OG8.5	Describe and demonstrate pelvic assessment in a model	K/S	SH	Y	DOAP session	Skill assessment			
OG8.6	Assess and counsel a patient in a simulated environment regarding appropriate nutrition in pregnancy	K/S	SH	Y	DOAP session, Bedside clinic	Skill assessment			
OG8.7	Enumerate the indications for and types of vaccination in pregnancy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
OG8.8	Enumerate the indications and describe the investigations including the use of ultrasound in the initial assessment and monitoring in pregnancy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
Topic: Complications in early pregnancy		**Number of competencies: (05)**				**Number of procedures that require certification: (NIL)**			
OG9.1	Classify, define and discuses the aetiology and management of abortions including threatened, incomplete, inevitable, missed and septic	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
OG9.2	Describe the steps and observe/ assist in the performance of an MTP evacuation	S	SH	Y	DOAP session, Bedside clinic	Viva voce		Forensic Medicine	
OG9.3	Discuss the aetiology, clinical features, differential diagnosis of acute abdomen in early pregnancy (with a focus on ectopic pregnancy) and enumerate the principles of medical and surgical management	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
OG9.4	Discuss the clinical features, laboratory investigations, ultrasonography, differential diagnosis, principles of management and follow up of gestational trophoblastic neoplasms	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Radiodiagnosis
OG9.5	Describe the etiopathology, impact on maternal and fetal health and principles of management of hyperemesis gravidarum	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
Topic: Antepartum haemorrhage		**Number of competencies: (02)**				**Number of competencies that require certification: (NIL)**			
OG10.1	Define, classify and describe the aetiology, pathogenesis, clinical features, ultrasonography, differential diagnosis and management of antepartum haemorrhage in pregnancy	K	KH	Y	Lecture, Small group disussion, Bedside clinic				
OG10.2	Enumerate the indications and describe the appropriate use of blood and blood products, their complications and management.	K	KH	Y	Lecture, Small group discussion			Pathology	
Topic: Multiple pregnancies		**Number of competencies: (01)**				**Number of procedures that require certification : (NIL)**			
OG11.1	Describe the etiopathology, clinical features; diagnosis and investigations, complications, principles of management of multiple pregnancies	K	KH	Y	Lecture, Small group discussion, Bedside clinics	Theory/ OSCE/ Clinical assessment/ Viva voce			
Topic: Medical Disorders in pregnancy		**Number of competencies: (08)**				**Number of procedures that require certification : (NIL)**			
OG12.1	Define, classify and describe the etiology and pathophysiology, early detection, investigations; principles of management of hypertensive disorders of pregnancy and eclampsia, complications of eclampsia.	K	KH	Y	Lecture, Small group discussion, Bedside clinics	Written/ Viva voce/ Skill assessment			General Medicine

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
OG12.2	Define, classify and describe the etiology, pathophysiology, diagnosis, investigations, adverse effects on the mother and foetus and the management during pregnancy and labor, and complications of anemia in pregnancy	K	KH	Y	Lecture, Small group discussion, Bedside clinics	Written/ Viva voce/ Skill assessment			General Medicine
OG12.3	Define, classify and describe the etiology, pathophysiology, diagnosis, investigations, criteria, adverse effects on the mother and foetus and the management during pregnancy and labor, and complications of diabetes in pregnancy	K	KH	Y	Lecture, Small group discussion, Bedside clinics	Written/ Viva voce/ Skill assessment			General Medicine
OG12.4	Define, classify and describe the etiology, pathophysiology, diagnosis, investigations, criteria, adverse effects on the mother and foetus and the management during pregnancy and labor, and complications of heart diseases in pregnancy	K	KH	Y	Lecture, Small group discussion, Bedside clinics	Written/ Viva voce/ Skill assessment			General Medicine
OG12.5	Describe the clinical features, detection, effect of pregnancy on the disease and impact of the disease on pregnancy complications and management of urinary tract infections in pregnancy	K	KH	Y	Lecture, Small group discussion, Bedside clinics	Written/ Viva voce/ Skill assessment			General Medicine
OG12.6	Describe the clinical features, detection, effect of pregnancy on the disease and impact of the disease on pregnancy complications and management of liver disease in pregnancy	K	KH	Y	Lecture, Small group discussion, Bedside clinics	Written/ Viva voce/ Skill assessment			General Medicine
OG12.7	Describe and discuss screening, risk factors, management of mother and newborn with HIV	K	KH	Y	Lecture, Small group discussion, Bedside clinics	Written/ Viva voce/ Skill assessment			General Medicine
OG12.8	Describe the mechanism, prophylaxis, fetal complications, diagnosis and management of isoimmunization in pregnancy	K	KH	Y	Lecture, Small group discussion, Bedside clinics	Written/ Viva voce/ Skill assessment			

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
Topic: Labour		**Number of competencies: (05)**				**Number of procedures that require certification : (01)**			
OG13.1	Enumerate and discuss the physiology of normal labor, mechanism of labor in occipito-anterior presentation; monitoring of labor including partogram; conduct of labor, pain relief; principles of induction and acceleration of labor; management of third stage of labor.	K/S	KH	Y	Lecture, Small group discussion (with models/ videos/ AV aids, etc.)	Theory/Clinical assessment/ Viva voce			
OG13.2	Define, describe the causes, pathophysiology, diagnosis, investigations and management of preterm labor, PROM and postdated pregnancy	K/S	KH	Y	Lecture, Small group discussion, Bedside clinics	Theory/ OSCE/ Clinical assessment/ Viva voce			
OG13.3	Observe/ assist in the performance of an artificial rupture of membranes	S	SH	N	DOAP session, Bedside clinic	Skill assessment			
OG13.4	Demonstrate the stages of normal labor in a simulated environment / mannequin and counsel on methods of safe abortion.	S	SH	Y	DOAP session	Skill assessment			
OG13.5	Observe and assist the conduct of a normal vaginal delivery	S	P	Y	DOAP session	Log book	10		
Topic: Abnormal Lie and Presentation; Maternal Pelvis		**Number of competencies: (04)**				**Number of procedures that need certification : (NIL)**			
OG14.1	Enumerate and discuss the diameters of maternal pelvis and types	K	KH	Y	Lecture, Small group discussion DOAP session, Bedside clinic	Written/ Viva voce/ Skill assessment		Human Anatomy	
OG14.2	Discuss the mechanism of normal labor, Define and describe obstructed labor, its clinical features; prevention; and management	K	KH	Y	Lecture, Small group discussion DOAP session, Bedside clinic	Written/ Viva voce/ Skill assessment			

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
OG14.3	Describe and discuss rupture uterus, causes, diagnosis and management.	K	KH	Y	Lecture, Small group discussion DOAP session, Bedside clinic	Written/ Viva voce/ Skill assessment			
OG14.4	Describe and discuss the classification; diagnosis; management of abnormal labor	K	KH	Y	Lecture, Small group discussion, Bedside clinics	Written/ skill assessment			
Topic: Operative obstetrics		**Number of competencies: (02)**				**Number of procedures that require certification : (NIL)**			
OG15.1	Enumerate and describe the indications and steps of common obstetric procedures, technique and complications: Episiotomy, vacuum extraction; low forceps; Caesarean section, assisted breech delivery; external cephalic version; cervical cerclage	S	KH	Y	Lecture, Small group discussion, seminars	Written/ skill assessment			
OG15.2	Observe and assist in the performance of an episiotomy and demonstrate the correct suturing technique of an episiotomy in a simulated environment. Observe/Assist in operative obstetrics cases – including - CS, Forceps, vacuum extraction, and breech delivery	S	SH	Y	DOAP session, Bedside clinic	Skill assessment			
Topic: Complications of the third stage		**Number of competencies: (03)**				**Number of procedures that require certification : (NIL)**			
OG16.1	Enumerate and discuss causes, prevention, diagnosis, management, appropriate use of blood and blood products in postpartum haemorrhage	K	KH	Y	Lecture, Small group discussion, Bedside clinics	Written/ skill assessment			
OG16.2	Describe and discuss uterine inversion – causes, prevention, diagnosis and management.	K	KH	Y	Lecture, Small group discussion, Bedside clinics	Written/ Viva voce			

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
OG16.3	Describe and discuss causes, clinical features, diagnosis, investigations; monitoring of fetal well-being, including ultrasound and fetal Doppler; principles of management; prevention and counselling in intrauterine growth retardation	K/S	KH	Y	Lecture, Small group discussion, Bedside clinics	Written/ skill assessment/ Viva voce			
Topic: Lactation		**Number of competencies: (03)**			**Number of procedures that require certification : (NIL)**				
OG17.1	Describe and discuss the physiology of lactation	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
OG17.2	Counsel in a simulated environment, care of the breast, importance and the technique of breast feeding	S/A/C	SH	Y	DOAP session	Skill assessment			
OG17.3	Describe and discuss the clinical features, diagnosis and management of mastitis and breast abscess	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
Topic: Care of the new born		**Number of competencies: (04)**			**Number of procedures that require certification : (NIL)**				
OG18.1	Describe and discuss the assessment of maturity of the newborn, diagnosis of birth asphyxia, principles of resuscitation, common problems.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Pediatrics
OG18.2	Demonstrate the steps of neonatal resuscitation in a simulated environment	S	SH	Y	DOAP session	Skill assessment			Pediatrics
OG18.3	Describe and discuss the diagnosis of birth asphyxia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Pediatrics
OG18.4	Describe the principles of resuscitation of the newborn and enumerate the common problems encountered	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Pediatrics

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
Topic: Normal and abnormal puerperium.		**Number of competencies: (04)**			**Number of procedures that require certification : (NIL)**				
OG19.1	Describe and discuss the physiology of puerperium, its complications, diagnosis and management; counselling for contraception, puerperal sterilization	K	KH	Y	Lecture, Small group discussion, Bedside clinics	Written/ Viva voce			
OG19.2	Counsel in a simulated environment, contraception and puerperal sterilisation	S/A/C	SH	Y	DOAP session	Skill assessment		Community Medicine	
OG19.3	Observe/ assist in the performance of tubal ligation	S	KH	Y	DOAP session, intraoperative	Skill assessment			
OG19.4	Enumerate the indications for, describe the steps in and insert and remove an intrauterine device in a simulated environment	S	SH	Y	DOAP session	Skill assessment			
Topic: Medical termination of pregnancy		**Number of competencies: (03)**			**Number of procedures that require certification : (NIL)**				
OG20.1	Enumerate the indications and describe and discuss the legal aspects, indications, methods for first and second trimester MTP; complications and management of complications of Medical Termination of Pregnancy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Forensic Medicine	
OG20.2	In a simulated environment administer informed consent to a person wishing to undergo Medical Termination of Pregnancy	S/A/C	SH	Y	DOAP session	Skill assessment		Forensic Medicine	
OG20.3	Discuss Pre-conception and Pre Natal Diagnostic Techniques (PC& PNDT) Act 1994 & its amendments	K	K/KH	Y	Lecture, Small group discussion	Written/Viva voce		Forensic Medicine	

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
Topic: Contraception		**Number of competencies: (02)**			**Number of procedures that require certification : (NIL)**				
OG21.1	Describe and discuss the temporary and permanent methods of contraception, indications, technique and complications; selection of patients, side effects and failure rate including Ocs, male contraception, emergency contraception and IUCD	K	KH	Y	Lecture, Small group discussion, Bedside clinics	Written/ Viva voce/ Skill assessment		Community medicine	
OG21.2	Describe & discuss PPIUCD programme	K	K/KH	Y	Lecture, Small group discussion	Written/Viva voce			
Topic: Vaginal discharge		**Number of competencies: (02)**			**Number of procedures that require certification :(NIL)**				
OG22.1	Describe the clinical characteristics of physiological vaginal discharge.	K	KH	Y	Lecture	Theory			
OG22.2	Describe and discuss the etiology (with special emphasis on Candida, T. vaginalis, bacterial vaginosis), characteristics, clinical diagnosis, investigations, genital hygiene, management of common causes and the syndromic management	K	KH	Y	Lecture, Bedside clinics	Written/ Viva voce/ Skill assessment			
Topic: Normal and abnormal puberty		**Number of competencies: (03)**			**Number of procedures that require certification : (NIL)**				
OG23.1	Describe and discuss the physiology of puberty, features of abnormal puberty, common problems and their management	K	KH	Y	Lecture, Small group discussion, Bedside clinics	Written/ Viva voce			
OG23.2	Enumerate the causes of delayed puberty. Describe the investigation and management of common causes	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
OG23.3	Enumerate the causes of precocious puberty	K	K	N	Lecture, Small group discussion	Written/ Viva voce			

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
Topic: Abnormal uterine bleeding		**Number of competencies: (01)**			**Number of procedures that require certification: (NIL)**				
OG24.1	Define, classify and discuss abnormal uterine bleeding, its aetiology, clinical features, investigations, diagnosis and management	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
Topic: Amenorrhea		**Number of competencies: (01)**			**Number of procedures that require certification : (NIL)**				
OG25.1	Describe and discuss the causes of primary and secondary amenorrhea, its investigation and the principles of management.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
Topic: Genital injuries and fistulae		**Number of competencies: (02)**			**Number of procedures that require certification : (NIL)**				
OG26.1	Describe and discuss the etiopathogenesis, clinical features; investigation and implications on health and fertility and management of endometriosis and adenomyosis	K/S	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
OG26.2	Describe the causes, prevention, clinical features, principles of management of genital injuries and fistulae	K	KH	N	Lecture, Small group discussion	Written/ Viva voce			General Surgery
Topic: Genital infections		**Number of competencies: (04)**			**Number of procedures that require certification : (NIL)**				
OG27.1	Describe and discuss the etiology, pathology, clinical features, differential diagnosis, investigations, management and long term implications of sexually transmitted infections	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
OG27.2	Describe and discuss the etiology, pathology, clinical features, differential diagnosis, investigations, management and long term implications of genital tuberculosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
OG27.3	Describe and discuss the etiology, pathology, clinical features, differential diagnosis, investigations, management and long term implications of HIV	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
OG27.4	Describe and discuss the etiology, pathology, clinical features, differential diagnosis, investigations, management and long term implications of Pelvic Inflammatory Disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
Topic: Infertility		**Number of competencies:(04)**			**Number of procedures that require certification : (NIL)**				
OG28.1	Describe and discuss the common causes, pathogenesis, clinical features, differential diagnosis; investigations; principles of management of infertility – methods of tubal patency, ovulation induction, assisted reproductive techniques	K	KH	Y	Lecture, seminars, Bedside clinics	Written/ Viva voce			
OG28.2	Enumerate the assessment and restoration of tubal latency	K	K	N	Lecture, seminars, Bedside clinics	Written/ Viva voce			
OG28.3	Describe the principles of ovulation induction	K	KH	Y	Lecture, seminars, Bedside clinics	Written/ Viva voce			
OG28.4	Enumerate the various Assisted Reproduction Techniques	K	K	N	Lecture, seminars, Bedside clinics	Written/ Viva voce			
Topic: Uterine fibroids		**Number of competencies: (01)**			**Number of procedures that require certification : (NIL)**				
OG29.1	Describe and discuss the etiology; pathology; clinical features; differential diagnosis; investigations; principles of management, complications of fibroid uterus	K/A/C	KH	Y	Lecture, Bedside clinics	Theory/ OSCE/ Clinical Assessment/ Viva voce			
Topic: PCOS and hirsutism		**Number of competencies: (02)**			**Number of procedures that require certification : (NIL)**				
OG30.1	Describe and discuss the etiopathogenesis; clinical features; differential diagnosis; investigations; management, complications of PCOS	K/A/C	KH	Y	Lecture	Theory/ OSCE/ Clinical Assessment/ Viva voce			
OG30.2	Enumerate the causes and describe the investigations and management of hyperandrogenism	K	KH	N		Theory/ OSCE/ Clinical Assessment/ Viva voce			

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
Topic: Uterine prolapse		**Number of competencies: (01)**			**Number of procedures that require certification :(NIL)**				
OG31.1	Describe and discuss the etiology, classification, clinical features, diagnosis, investigations, principles of management and preventive aspects of prolapse of uterus	K/S	KH	Y	Lecture, small group discussion, Bedside clinics	Written/ Viva voce/ Skill assessment			
Topic: Menopause		**Number of competencies: (02)**			**Number of procedures that require certification : (NIL)**				
OG32.1	Describe and discuss the physiology of menopause, symptoms, prevention, management and the role of hormone replacement therapy.	K	KH	Y	Lecture, small group discussion, Bedside clinics	Written/ Viva voce/ Skill assessment			
OG32.2	Enumerate the causes of postmenopausal bleeding and describe its management	K	KH	Y	Lecture, small group discussion Bedside clinics	Written/ Viva voce			
Topic: Benign, Pre-malignant (CIN) and Malignant Lesions of the Cervix		**Number of competencies: (04)**			**Number of procedures that require certification : (NIL)**				
OG33.1	Classify, describe and discuss the etiology, pathology, clinical features, differential diagnosis, investigations and staging of cervical cancer	K/S	KH	Y	Lecture, Small group discussion, Bedside clinics	Written/ Viva voce/ Skill assessment			
OG33.2	Describe the principles of management including surgery and radiotherapy of Benign, Pre-malignant (CIN) and Malignant Lesions of the Cervix	K	KH	Y	Lecture, Small group discussion, Bedside clinics	Written/ Viva voce/ Skill assessment			General Surgery
OG33.3	Describe and demonstrate the screening for cervical cancer in a simulated environment	K/S	SH	Y	DOAP session	Skill assessment		Community Medicine	
OG33.4	Enumerate the methods to prevent cancer of cervix including visual inspection with acetic acid (VIA), visual inspection of cervix with Lugol's iodine (VILI), pap smear and colposcopy	K	K	Y	Lecture, Small group discussion, Bedside clinics	Viva voce/ Written			

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
Topic: Benign and malignant diseases of the uterus and the ovaries		**Number of competencies: (04)**				**Number of procedures that require certification : (NIL)**			
OG34.1	Describe and discuss aetiology, pathology, staging clinical features, differential diagnosis, investigations, staging laparotomy and principles of management of endometrial cancer	K	KH	Y	Lecture, Bedside clinics	Viva voce/ Written/ skill assessment			
OG34.2	Describe and discuss the etiology, pathology, classification, staging of ovarian cancer, clinical features, differential diagnosis, investigations, principal of management including staging laparotomy	K/S	KH	Y	Lecture	Theory/ OSCE/ clinical assessment/ Viva voce			
OG34.3	Describe and discuss the etiology, pathology, classification, staging, clinical features, differential diagnosis, investigations and management of gestational trophoblastic disease	K/S	KH	Y	Lecture	Theory/ OSCE/ clinical assessment/			
OG34.4	Operative Gynaecology : Understand and describe the technique and complications: Dilatation & Curettage (D&C); EA-ECC; cervical biopsy; abdominal hysterectomy; myomectomy; surgery for ovarian tumours; staging laparotomy; vaginal hysterectomy including pelvic floor repair; Fothergill's operation, Laparoscopy; hysteroscopy; management of postoperative complications	K/S	SH	Y	Videos, on manikins, observe procedures and surgeries in OR	Viva voce			
Topic: Obstetrics & Gynecological skills - I		**Number of competencies: (17)**				**Number of procedures that require certification : (NIL)**			
OG35.1	Obtain a logical sequence of history, and perform a humane and thorough clinical examination, excluding internal examinations (per-rectal and per-vaginal)	K/S	SH	Y	Bedside clinics	Clinical assessment/ Viva voce			
OG35.2	Arrive at a logical provisional diagnosis after examination.	K/S	SH	Y	Bedside clinics	Clinical assessment/ Viva voce			
OG35.3	Recognize situations, which call for urgent or early treatment at secondary and tertiary centres and make a prompt referral of such patients after giving first aid or emergency treatment.	K/S	SH	Y	Bedside clinics	Clinical assessment/ Viva voce			

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
OG35.4	Demonstrate interpersonal and communication skills befitting a physician in order to discuss illness and its outcome with patient and family	A/C	SH	Y	Bedside clinics	Clinical assessment/ Viva voce			
OG35.5	Determine gestational age, EDD and obstetric formula	K/S	SH	Y	Bedside clinics	Clinical assessment/ Viva voce			
OG35.6	Demonstrate ethical behavior in all aspects of medical practice.	A/C	SH	Y	Bedside clinics	Clinical assessment/ Viva voce			
OG35.7	Obtain informed consent for any examination / procedure	S	SH	Y	Bedside clinics	Clinical assessment/ Viva voce			
OG35.8	Write a complete case record with all necessary details	S	SH	Y	Bedside clinics	Clinical assessment/ Viva voce			
OG35.9	Write a proper discharge summary with all relevant information	S	SH	Y	Bedside clinics	Clinical assessment			
OG35.10	Write a proper referral note to secondary or tertiary centres or to other physicians with all necessary details.	S	SH	Y	Bedside clinics	Clinical assessment/ Viva voce			
OG35.11	Demonstrate the correct use of appropriate universal precautions for self-protection against HIV and hepatitis and counsel patients	S	SH	Y	DOAP session	Skill assessment			
OG35.12	Obtain a PAP smear in a stimulated environment	S	SH	Y	DOAP session	Skill assessment			
OG35.13	Demonstrate the correct technique to perform artificial rupture of membranes in a simulated / supervised environment	S	SH	Y	DOAP session	Skill assessment			
OG35.14	Demonstrate the correct technique to perform and suture episiotomies in a simulated/ supervised environment	S	SH	Y	DOAP session	Skill assessment			
OG35.15	Demonstrate the correct technique to insert and remove an IUD in a simulated/ supervised environment	S	SH	Y	DOAP session	Skill assessment			

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
OG35.16	Diagnose and provide emergency management of antepartum and postpartum hemorrhage in a simulated / guided environment	K/S	SH	Y	DOAP session	Skill assessment			
OG35.17	Demonstrate the correct technique of urinary catheterisation in a simulated/ supervised environment	S	SH	Y	DOAP session	Skill assessment			
Topic: Obstetrics & Gynecological skills - II		**Number of competencies: (03)**				**Number of procedures that require certification: (NIL)**			
OG36.1	Plan and institute a line of treatment, which is need based, cost effective and appropriate for common conditions taking into consideration (a) Patient (b) Disease (c) Socio-economic status (d) Institution/ Governmental guidelines.	K/S	SH	Y	Bedside clinics, Small group discussion	Clinical assessment/ Viva voce			
OG36.2	Organise antenatal, postnatal, well-baby and family welfare clinics	K/S	KH	Y	Bedside clinics	Clinical assessment/ Viva voce			
OG36.3	Demonstrate the correct technique of punch biopsy of uterus in a simulated/ supervised environment	S	SH	Y	Bedside clinics	Clinical assessment/ Viva voce			
Topic: Obstetrics & Gynecological skills - III		**Number of competencies: (07)**				**Number of procedures that require certification : (NIL)**			
OG37.1	Observe and assist in the performance of a Caesarean section	K/S/A/C	SH	Y	Bedside clinics, Small group discussion	Log book			
OG37.2	Observe and assist in the performance of Laparotomy	K/S/A/C	SH	Y	Bedside clinics, Small group discussion	Clinical assessment/ Viva voce			
OG37.3	Observe and assist in the performance of Hysterectomy – abdominal/vaginal	K/S/A/C	SH	Y	Bedside clinics, Small group discussion	Clinical assessment/ Viva voce			

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
OG37.4	Observe and assist in the performance of Dilatation & Curettage (D&C)	K/S/A/C	SH	Y	Bedside clinics, Small group discussion	Clinical assessment/ Viva voce			
OG37.5	Observe and assist in the performance of Endometrial aspiration - endocervical curettage (EA-ECC)	K/S/A/C	SH	Y	Bedside clinics, Small group discussion	Viva voce			
OG37.6	Observe and assist in the performance of outlet forceps application of vacuum and breech delivery	K/S/A/C	SH	Y	Bedside clinics, Small group discussion	Log book			
OG37.7	Observe and assist in the performance of MTP in the first trimester and evacuation in incomplete abortion	K/S/A/C	SH	Y	Bedside clinics, Small group discussion	Clinical assessment/ Viva voce			
Topic: Should observe		**Number of competencies: (04)**				**Number of procedures that require certification : (NIL)**			
OG38.1	Laparoscopy	K/S/A/C	KH	Y	Bedside clinic, Small group discussion	Clinical assessment/ Viva voce			
OG38.2	Hysteroscopy	K/S/A/C	KH	Y	Bedside clinics, Small group discussion	Clinical assessment/ Viva voce			
OG38.3	Lap sterilization	K/S/A/C	KH	Y	Bedside clinics, Small group discussion	Clinical assessment/ Viva voce			
OG38.4	Assess the need for and issue proper medical certificates to patients for various purposes	K/S/A/C	KH	Y	Bedside clinics, Small group discussion	Clinical assessment/ Viva voce			
	Column C: K- Knowledge, S – Skill, A - Attitude / professionalism, C- Communication. **Column D: K – Knows, KH - Knows How, SH - Shows how, P- performs independently,** **Column F: DOAP session – Demonstrate, Observe, Assess, Perform.** **Column H: If entry is P: indicate how many procedures must be done independently for certification/ graduation**								

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
Integration									
				Human Anatomy					
AN48.8	Mention the structures palpable during Vaginal & Rectal examination	K	KH	N	Lecture	Written		Obstetrics & Gynaecology, General Surgery	
AN49.1	Describe & demonstrate the Superficial & Deep perineal pouch (boundaries and contents)	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		Obstetrics & Gynaecology	
AN49.2	Describe & identify Perineal body	K/S	SH	Y	Lecture, Small group discussion, DOAP session	Viva voce/ skill assessment		Obstetrics & Gynaecology	
AN49.5	Explain the anatomical basis of Perineal tear, Episiotomy, Perianal abscess and Anal fissure	K	KH	N	Lecture	Written		Obstetrics & Gynaecology	
AN52.8	Describe the development of male & female reproductive system	K	KH	Y	Lecture	Written/ Viva voce		Obstetrics & Gynaecology	
AN53.1	Identify & hold the bone in the anatomical position, Describe the salient features, articulations & demonstrate the attachments of muscle groups	K/S	SH	Y	Lecture, DOAP session	Viva voce/ skill assessment		General Surgery, Obstetrics & Gynaecology	
AN53.2	Demonstrate anatomical position of bony pelvis & show boundaries of pelvic inlet, pelvic cavity, pelvic outlet	K/S	SH	Y	Lecture, DOAP session	Viva voce/ skill assessment		Obstetrics & Gynaecology	
AN53.3	Define true pelvis and false pelvis and demonstrate sex determination in male & female bony pelvis	K/S	SH	Y	Lecture, DOAP session	Viva voce/ skill assessment		Obstetrics & Gynaecology	
AN64.3	Describe various types of open neural tube defects with its embryological basis	K	KH	N	Lecture	Written/ Viva voce		Obstetrics & Gynaecology, Pediatrics	

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
AN75.5	Describe the principles of genetic counselling	K	KH	Y	Lecture	Written		Pediatrics, Obstetrics & Gynaecology	
AN77.1	Describe the uterine changes occurring during the menstrual cycle	K	KH	Y	Lecture	Written		Obstetrics & Gynaecology	
AN77.2	Describe the synchrony between the ovarian and menstrual cycles	K	KH	Y	Lecture	Written		Obstetrics & Gynaecology	
AN77.3	Describe spermatogenesis and oogenesis along with diagrams	K	KH	Y	Lecture	Written		Obstetrics & Gynaecology	
AN77.4	Describe stages and consequences of fertilisation	K	KH	Y	Lecture	Written		Obstetrics & Gynaecology	
AN77.5	Enumerate and describe the anatomical principles underlying contraception	K	KH	Y	Lecture	Written		Obstetrics & Gynaecology	
AN77.6	Describe teratogenic influences; fertility and sterility, surrogate motherhood, social significance of “sex-ratio”.	K	KH	N	Lecture	Written		Obstetrics & Gynaecology	
AN78.3	Describe the process of implantation & common abnormal sites of implantation	K	KH	Y	Lecture	Written		Obstetrics & Gynaecology	
AN78.5	Describe in brief abortion: decidual reaction, pregnancy test	K	KH	Y	Lecture	Written		Obstetrics & Gynaecology	
AN79.4	Describe the development of somites and intra-embryonic coelom	K	KH	Y	Lecture	Written		Obstetrics & Gynaecology	
AN79.5	Explain embryological basis of congenital malformations, nucleus pulposus, sacrococcygeal teratomas, neural tube defects	K	KH	N	Lecture	Written		Obstetrics & Gynaecology	
AN79.6	Describe the diagnosis of pregnancy in first trimester and role of teratogens, alpha-fetoprotein	K	KH	N	Lecture	Written		Obstetrics & Gynaecology	

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
AN80.3	Describe formation of placenta, its physiological functions, foetomaternal circulation & placental barrier	K	KH	Y	Lecture	Written		Obstetrics & Gynaecology	
AN80.4	Describe embryological basis of twinning in monozygotic & dizygotic twins	K	KH	Y	Lecture	Written		Obstetrics & Gynaecology	
AN80.5	Describe role of placental hormones in uterine growth & parturition	K	KH	Y	Lecture	Written		Obstetrics & Gynaecology	
AN80.6	Explain embryological basis of estimation of fetal age.	K	KH	N	Lecture	Written		Obstetrics & Gynaecology	
AN80.7	Describe various types of umbilical cord attachments	K	KH	N	Lecture	Written		Obstetrics & Gynaecology	
AN81.1	Describe various methods of prenatal diagnosis	K	KH	Y	Lecture	Written		Obstetrics & Gynaecology	
AN81.2	Describe indications, process and disadvantages of amniocentesis	K	KH	Y	Lecture	Written		Obstetrics & Gynaecology	
AN81.3	Describe indications, process and disadvantages of chorion villus biopsy	K	KH	Y	Lecture	Written		Obstetrics & Gynaecology	
Physiology									
PY9.6	Enumerate the contraceptive methods for male and female. Discuss their advantages & disadvantages	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology, Community Medicine	
PY9.8	Describe and discuss the physiology of pregnancy, parturition & lactation and outline the psychology and psychiatry-disorders associated with it.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology	

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PY9.10	Discuss the physiological basis of various pregnancy tests	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology	
PY9.11	Discuss the hormonal changes and their effects during perimenopause and menopause	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology	
PY9.12	Discuss the common causes of infertility in a couple and role of IVF in managing a case of infertility.	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology	
Biochemistry									
BI10.1	Describe cancer initiation, promotion, oncogenes & oncogene activation.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology, General Surgery, Pathology	
BI10.2	Describe various biochemical tumor markers and the biochemical basis of cancer therapy.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology, General Surgery, Pathology	
BI10.3	Describe the cellular and humoral components of the immune system & describe the types and structure of antibody	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology, General Surgery, Pathology	
Pathology									
PA22.2	Enumerate the indications describe the principles enumerate and demonstrate the steps of compatibility testing	S	SH	Y	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology	
PA30.1	Describe the epidemiology, pathogenesis, etiology, pathology, screening, diagnosis and progression of carcinoma of the cervix	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology	

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PA30.2	Describe the pathogenesis, etiology, pathology, diagnosis and progression and spread of carcinoma of the endometrium	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology	
PA30.3	Describe the pathogenesis, etiology, pathology, diagnosis and progression and spread of carcinoma of the leiomyomas and leiomyosarcomas	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology	
PA30.4	Classify and describe the etiology, pathogenesis, pathology, morphology, clinical course, spread and complications of ovarian tumors	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology	
PA30.5	Describe the etiology, pathogenesis, pathology, morphology, clinical course, spread and complications of gestational trophoblastic neoplasms	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology	
PA30.6	Describe the etiology and morphologic features of cervicitis	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology	
PA30.7	Describe the etiology, hormonal dependence, features and morphology of endometriosis	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology	
PA30.8	Describe the etiology and morphologic features of adenomyosis	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology	
PA30.9	Describe the etiology, hormonal dependence and morphology of endometrial hyperplasia	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology	
Pharmacology									
PH1.39	Describe mechanism of action, types, doses, side effects, indications and contraindications of the drugs used for contraception	K	KH	Y	Lecture	Written/ Viva voce		**Obstetrics & Gynaecology**	
PH1.40	Describe mechanism of action, types, doses, side effects, indications and contraindications of 1. Drugs used in the treatment of infertility, and 2. Drugs used in erectile dysfunction	K	KH	Y	Lecture	Written/ Viva voce		Obstetrics & Gynaecology	

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PH1.41	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of uterine relaxants and stimulants	K	KH	Y	Lecture	Written/ Viva voce		Obstetrics & Gynaecology	
Community Medicine									
CM9.2	Define, calculate and interpret demographic indices including birth rate, death rate, fertility rates	S	SH	Y	Lecture, Small group discussion, DOAP sessions	Skill assessment		Obstetrics & Gynaecology, Pediatrics	
CM9.5	Describe the methods of population control	K	KH	Y	Small group discussion, Lecture	Written/ Viva voce		Obstetrics & Gynaecology	
CM10.1	Describe the current status of Reproductive, maternal, newborn and Child Health	K	KH	Y	Small group discussion, Lecture	Written/ Viva voce		Obstetrics & Gynaecology, Pediatrics	
CM10.2	Enumerate and describe the methods of screening high risk groups and common health problems	K	KH	Y	Small group discussion, Lecture	Written/ Viva voce		Obstetrics & Gynaecology, Pediatrics	
CM10.3	Describe local customs and practices during pregnancy, childbirth, lactation and child feeding practices	K	KH	Y	Small group discussion, Lecture	Written/ Viva voce		Obstetrics & Gynaecology, Pediatrics	
CM10.4	Describe the reproductive, maternal, newborn & child health (RMCH); child survival and safe motherhood interventions	K	KH	Y	Small group discussion, Lecture	Written / Viva voce		Obstetrics & Gynaecology, Pediatrics	
Forensic Medicine & Toxicology									
FM3.13	Describe different types of sexual offences. Describe various sections of IPC regarding rape including definition of rape (Section 375 IPC), Punishment for Rape (Section 376 IPC) and recent amendments notified till date.	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology	

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
FM3.14	SEXUAL OFFENCES Describe and discuss the examination of the victim of an alleged case of rape, and the preparation of report, framing the opinion and preservation and despatch of trace evidences in such cases.	K	K/KH	Y	Lecture, Small group discussion, Bed side clinic, DOAP session	Written/ Viva voce/ OSCE		Obstetrics & Gynaecology, Psychiatry	
FM3.15	SEXUAL OFFENCES Describe and discuss examination of accused and victim of sodomy, preparation of report, framing of opinion, preservation and despatch of trace evidences in such cases	K	K/KH	Y	Lecture, Small group discussion, Bed side clinic, DOAP session	Written/ Viva voce/ OSCE		Obstetrics & Gynaecology, Psychiatry	
FM3.16	SEXUAL OFFENCES Describe and discuss adultery and unnatural sexual offences - sodomy, incest, lesbianism, buccal coitus, bestiality, indecent assault and preparation of report, framing the opinion and preservation and despatch of trace evidences in such cases.	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology	
FM3.17	Describe and discuss the sexual perversions fetishism, transvestism, voyeurism, sadism, necrophagia, masochism, exhibitionism, frotteurism, Necrophilia.	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology, Psychiatry	
FM3.18	Describe anatomy of male and female genitalia, hymen and its types. Discuss the medico-legal importance of hymen. Define virginity, defloration, legitimacy and its medicolegal importance.	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology	
FM3.19	Discuss the medicolegal aspects of pregnancy and delivery, signs of pregnancy, precipitate labour superfoetation, superfecundation and signs of recent and remote delivery in living and dead	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology	
FM3.20	Discuss disputed paternity and maternity	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology	
FM3.21	Discuss Pre-conception and Pre Natal Diagnostic Techniques (PCPNDT)- Prohibition of Sex Selection Act 2003 and Domestic Violence Act 2005	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology, AETCOM	

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
FM3.22	Define and discuss impotence, sterility, frigidity, sexual dysfunction, premature ejaculation. Discuss the causes of impotence and sterility in male and female	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology, General Medicine	
FM3.23	Discuss Sterilization of male and female, artificial insemination, Test Tube Baby, surrogate mother, hormonal replacement therapy with respect to appropriate national and state laws	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology	
FM3.24	Discuss the relative importance of surgical methods of contraception (vasectomy and tubectomy) as methods of contraception in the national family Planning Programme	K	K/KH	N	Lecture, Small group discussion	Written		Obstetrics & Gynaecology	
FM3.25	Discuss the major results of the National Family Health Survey	K	K/KH	N	Lecture	Written		Obstetrics & Gynaecology	
FM3.26	Discuss the National Guidelines for accreditation, supervision & regulation of ART Clinics in India	K	K/KH	Y	Lecture, Small group discussion	Written		Obstetrics & Gynaecology	
FM3.27	Define, classify and discuss abortion, methods of procuring MTP and criminal abortion and complication of abortion: MTP Act 1971	K	K/KH	Y	Lecture, Small group discussion	Written/Viva voce		Obstetrics & Gynaecology, AETCOM	
FM3.28	Describe evidences of abortion - living and dead, duties of doctor in cases of abortion, investigations of death due to criminal abortion	K	K/KH	Y	Lecture, Small group discussion	Written/Viva voce		Obstetrics & Gynaecology, AETCOM	
Dermatology & Venereology									
DR10.11	Describe the etiology, diagnostic and clinical features and management of vaginal discharge	K	KH	Y	Lecture, Small group discussion	Written / Viva voce		Obstetrics & Gynaecology	

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
			General Medicine						
IM26.43	Identify, discuss and defend medicolegal, sociocultural, economic and ethical issues as they pertain to in vitro fertilisation donor insemination and surrogate motherhood	K	KH	N	Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology	
			Radiodiagnosis						
RD1.13	Describe the components of the PC & PNDT Act and its medicolegal implications	K	KH	Y	Lecture, Small group discussion			Obstetrics & Gynaecology, Forensic Medicine	
			Pediatrics						
PE7.1	Awareness on the cultural beliefs and practices of breast feeding	K	K	N	Lecture, Small group discussion	Viva voce			Obstetrics & Gynaecology
PE7.7	Perform breast examination and identify common problems during lactation such as retracted nipples, cracked nipples, breast engorgement, breast abscess	S	SH	Y	Bed side clinics Skill Lab	Skill Assessment			Obstetrics & Gynaecology
PE7.8	Educate mothers on ante natal breast care and prepare mothers for lactation	A/C	SH	Y	DOAP session	Document in Log Book			Obstetrics & Gynaecology, AETCOM
PE7.9	Educate and counsel mothers for best practices in breast feeding	A/C	SH	Y	DOAP session	Document in Log Book			Obstetrics & Gynaecology, AETCOM
PE18.1	List and explain the components, plans , outcomes of Reproductive Child Health (RCH) program and appraise the monitoring and evaluation	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine	Obstetrics & Gynaecology
PE18.2	Explain preventive interventions for Child survival and safe motherhood	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine	Obstetrics & Gynaecology

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PE18.3	Conduct Antenatal examination of women independently and apply at-risk approach in antenatal care	S	SH	Y	Bed side clinics	Skill station		Community Medicine	Obstetrics & Gynaecology
PE18.4	Provide intra-natal care and conduct a normal Delivery in a simulated environment	S	SH	Y	DOAP session, Skills lab	Document in Log Book		Community Medicine	Obstetrics & Gynaecology
PE18.5	Provide intra-natal care and observe the conduct of a normal delivery	S	SH	Y	DOAP session	Document in Log Book			Obstetrics & Gynaecology
PE18.6	Perform Postnatal assessment of newborn and mother, provide advice on breast feeding, weaning and on family planning	S	SH	Y	Bed side clinics, Skill Lab	Skill Assessment		Community Medicine	Obstetrics & Gynaecology
PE18.8	Observe the implementation of the program by visiting the Rural Health Centre	S	KH	Y	Bed side clinics, Skill Lab	Document in log book		Community Medicine	Obstetrics & Gynaecology
PE20.6	Explain the follow up care for neonates including Breast feeding, temperature maintenance, immunization, importance of growth monitoring and red flags	S	SH	Y	DOAP session	Log book entry			Obstetrics & Gynaecology
PE32.6	Discuss the genetic basis, risk factors, clinical features, complications, prenatal diagnosis, management and genetic counselling in Turner's Syndrome	K	KH	N	Lecture, Small group discussion	Written/ Viva voce			General Medicine, Obstetrics & Gynaecology
PE32.8	Interpret normal Karyotype and recognize the Turner Karyotype	S	SH	N	Bed Side clinics, Skill lab	Log book			General Medicine, Obstetrics & Gynaecology
PE32.9	Discuss the referral criteria and multidisciplinary approach to management of Turner Syndrome	K	KH	N	Lecture, Small group discussion	Written/ Viva voce			General Medicine, Obstetrics & Gynaecology

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
Radiotherapy									
RT4.5	Describe and discuss role of radiation in management of common malignancies in India (region specific)	K	KH	Y	Lecture, Bed side clinic	Written/ Viva voce		Pathology	General Surgery, Obstetrics & Gynaecology
RT4.6	Describe and discuss radiotherapy for benign disease	K	KH	Y	Lecture	Written/ Viva voce		Pathology	General Surgery, Obstetrics & Gynaecology
RT4.7	Counsel patients regarding acute and late effects of radiation and supportive care	K/A/S	KH	Y	Bed side clinic, group discussion	Written/ Viva voce		Pathology	General Surgery, Obstetrics & Gynaecology
RT4.8	Describe oncological emergencies and palliative care	K/A/S	K/KH	Y	Lecture and group discussion	Written/ Viva voce			General Surgery, Obstetrics & Gynaecology
RT5.1	Describe and discuss cancer prevention, screening, vaccination, cancer registry	K	K	Y	Group discussion	Written/ Viva voce		Pathology	General Surgery, Obstetrics & Gynaecology

ORTHOPAEDICS (CODE: OR)

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
ORTHOPEDICS									
Topic: Skeletal Trauma, Poly trauma		**Number of competencies : (06)**				**Number of procedures that require certification: (NIL)**			
OR1.1	Describe and discuss the Principles of pre-hospital care and Casuality management of a trauma victim including principles of triage	K/S/A/C	K/KH	Y	Lecture with video, Small group discussion	Written/ Viva voce/ OSCE/ Simulation			General Surgery, Anaesthesiology
OR1.2	Describe and discuss the aetiopathogenesis, clinical features, investigations, and principles of management of shock	K/S	K/KH	Y	Lecture	Written/ Viva voce/ OSCE/ Simulation			General Surgery
OR1.3	Describe and discuss the aetiopathogenesis, clinical features, investigations, and principles of management of soft tissue injuries	K	KH/SH	Y	Lecture, Small group discussion	Written/ OSCE			General Surgery
OR1.4	Describe and discuss the Principles of management of soft tissue injuries	K	K/KH	Y	Lecture, Small group discussion	Written/ Assesment/ Viva voce			General Surgery
OR1.5	Describe and discuss the aetiopathogenesis, clinical features, investigations, and principles of management of dislocation of major joints, shoulder, knee, hip	K	K/KH	Y	Lecture, Small group discussion, Bed side clinic	Written/ Viva voce/ OSCE/ Simulation			
OR1.6	Participate as a member in the team for closed reduction of shoulder dislocation / hip dislocation / knee dislocation	K/S/A/C	SH	Y	Simulation, DOAP session	OSCE/ Simulation			
Topic: Fractures		**Number of competencies : (16)**				**Number of procedures that require certification: (NIL)**			
OR2.1	Describe and discuss the mechanism of Injury, clinical features, investigations and plan management of fracture of clavicle	K/S	KH/SH	Y	Lecture, Small group discussion, Bed side clinic	Written/ Viva voce/ OSCE		Human Anatomy	

Number	**COMPETENCY** **The student should be able to:**	**Domain K/S/A/C**	**Level K/KH/ SH/P**	**Core (Y/N)**	**Suggested Teaching Learning method**	**Suggested Assessment method**	**Number required to certify P**	**Vertical Integration**	**Horizontal Integration**
OR2.2	Describe and discuss the mechanism of Injury, clinical features, investigations and plan management of fractures of proximal humerus	K	K/KH/ SH	Y	Lecture, Small group discussion, Bed side clinic	Written/ Viva voce/ OSCE		Human Anatomy	
OR2.3	Select, prescribe and communicate appropriate medications for relief of joint pain	K	KH/SH	Y	Lecture, Small group discussion, Bed side clinic	Written/ Viva voce/ OSCE		Human Anatomy	
OR2.4	Describe and discuss the mechanism of injury, clinical features, investigations and principles of management of fracture of shaft of humerus and intercondylar fracture humerus with emphasis on neurovasular deficit	K/S	K/KH	Y	Lecture, Small group discussion, Bed side clinic	Written/ Viva voce/ OSCE		Human Anatomy	
OR2.5	Describe and discuss the aetiopathogenesis, clinical features, mechanism of injury, investigation & principles of management of fractures of both bones forearm and Galeazzi and Monteggia injury	K	K/KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
OR2.6	Describe and discuss the aetiopathogenesis, mechanism of injury, clinical features, investigations and principles of management of fractures of distal radius	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
OR2.7	Describe and discuss the aetiopathogenesis, mechanism of injury, clinical features, investigations and principles of management of pelvic injuries with emphasis on hemodynamic instability	K	K/KH/ SH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
OR2.8	Describe and discuss the aetiopathogenesis, mechanism of injury, clinical features, investigations and principles of management of spine injuries with emphasis on mobilisation of the patient	K	K/KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
OR2.9	Describe and discuss the mechanism of injury, Clinical features, investigations and principle of management of acetabular fracture	K	K/KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	

Number	**COMPETENCY** **The student should be able to:**	**Domain K/S/A/C**	**Level K/KH/ SH/P**	**Core (Y/N)**	**Suggested Teaching Learning method**	**Suggested Assessment method**	**Number required to certify P**	**Vertical Integration**	**Horizontal Integration**
OR2.10	Describe and discuss the aetiopathogenesis, mechanism of injury, clinical features, investigations and principles of management of fractures of proximal femur	K/S/A/C	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
OR2.11	Describe and discuss the aetiopathogenesis, mechanism of injury, clinical features, investigations and principles of management of (a) Fracture patella (b) Fracture distal femur (c) Fracture proximal tibia with special focus on neurovascular injury and compartment syndrome	K	K/KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
OR2.12	Describe and discuss the aetiopathogenesis, clinical features, investigations and principles of management of Fracture shaft of femur in all age groups and the recognition and management of fat embolism as a complication	K	K/KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
OR2.13	Describe and discuss the aetiopathogenesis, clinical features, Investigation and principles of management of: (a) Fracture both bones leg (b) Calcaneus (c) Small bones of foot	K	K/KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
OR2.14	Describe and discuss the aetiopathogenesis, clinical features, Investigation and principles of management of ankle fractures	K/S/C	K/KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
OR2.15	Plan and interpret the investigations to diagnose complications of fractures like malunion, non-union, infection, compartmental syndrome	K/S	SH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
OR2.16	Describe and discuss the mechanism of injury, clinical features, investigations and principles of management of open fractures with focus on secondary infection prevention and management	K	K/KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	

Number	**COMPETENCY** **The student should be able to:**	**Domain K/S/A/C**	**Level K/KH/ SH/P**	**Core (Y/N)**	**Suggested Teaching Learning method**	**Suggested Assessment method**	**Number required to certify P**	**Vertical Integration**	**Horizontal Integration**
Topic: Musculoskeletal Infection		**Number of competencies : (03)**				**Number of Procedures that require certification: (NIL)**			
OR3.1	Describe and discuss the aetiopathogenesis, clinical features, investigations and principles of management of Bone and Joint infections a) Acute Osteomyelitis b) Subacute osteomyelitis c) Acute Suppurative arthritis d) Septic arthritis & HIV infection e) Spirochaetal infection f) Skeletal Tuberculosis	K/S	K/KH/ SH	Y	Lecture, Small group discussion, Video assisted lecture	Written/ Viva voce/ OSCE		Pathology, Microbiology	General surgery
OR3.2	Participate as a member in team for aspiration of joints under supervision	K/S/A/C	SH	Y	Small group Discussion. DOAP session	Viva voce/ OSCE/ Skills assessment		_	
OR3.3	Participate as a member in team for procedures like drainage of abscess, sequestrectomy/ saucerisation and arthrotomy	K/S/A/C	SH	Y	DOAP session, Video demonstration	Viva voce/ OSCE/ Skills assessment			General Surgery
Topic: Skeletal Tuberculosis		**Number of competencies : (01)**				**Number of procedures that require certification: (NIL)**			
OR4.1	Describe and discuss the clinical features, Investigation and principles of management of Tuberculosis affecting major joints (Hip, Knee) including cold abcess and caries spine	K	K/KH	Y	Lecture, Small group discussion, Case discussion	Written/ Viva voce/ OSCE		Pathology	General surgery
Topic: Rheumatoid Arthritis and associated inlammatory disorders		**Number of competencies : (01)**				**Number of procedures that require certification: (NIL)**			

Number	**COMPETENCY** **The student should be able to:**	**Domain K/S/A/C**	**Level K/KH/ SH/P**	**Core (Y/N)**	**Suggested Teaching Learning method**	**Suggested Assessment method**	**Number required to certify P**	**Vertical Integration**	**Horizontal Integration**
OR5.1	Describe and discuss the aetiopathogenesis, clinical features, investigations and principles of management of various inflammatory disorder of joints	K	K/KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE			General Medicine
Topic: Degenerative disorders		**Number of competencies : (01)**				**Number of procedures that require certification: (NIL)**			
OR6.1	Describe and discuss the clinical features, investigations and principles of management of degenerative condition of spine (Cervical Spondylosis, Lumbar Spondylosis, PID)	K	K/KH	Y	Lecture, Small group discussion, Case discussion	Written/ Viva voce/ OSCE			
Topic: Metabolic bone disorders		**Number of competencies : (01)**				**Number of procedures that require certification: (NIL)**			
OR7.1	Describe and discuss the aetiopathogenesis, clinical features, investigation and principles of management of metabolic bone disorders in particular osteoporosis, osteomalacia, rickets, Paget's disease	K	K/KH	Y	Lecture, Small group discussion, Case discussion	Written/ Viva voce/ OSCE			
Topic: Poliomyelitis		**Number of competencies : (01)**				**Number of procedures that require certification: (NIL)**			
OR8.1	Describe and discuss the aetiopathogenesis, clinical features, assessment and principles of management a patient with Post Polio Residual Paralysis	K	K/KH	Y	Lecture, Small group discussion, Case discussion	Written/ Viva voce/ OSCE			
Topic: Cerebral Palsy		**Number of competencies : (01)**				**Number of procedures that require certification: (NIL)**			

Number	**COMPETENCY** **The student should be able to:**	**Domain K/S/A/C**	**Level K/KH/ SH/P**	**Core (Y/N)**	**Suggested Teaching Learning method**	**Suggested Assessment method**	**Number required to certify P**	**Vertical Integration**	**Horizontal Integration**
OR9.1	Describe and discuss the aetiopathogenesis, clinical features, assessment and principles of management of Cerebral palsy patient	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce/ OSCE			
Topic:Bone Tumors		**Number of competencies : (01)**				**Number of procedures that require certification: (NIL)**			
OR10.1	Describe and discuss the aetiopathogenesis, clinical features, investigations and principles of management of benign and malignant bone tumours and pathological fractures	K	K/KH	Y	Lecture, Small group discussion, Video assisted interactive lecture	Written/ Viva voce/ OSCE		Pathology	General surgery, Radiotherapy
Topic: Peripheral nerve injuries		**Number of competencies : (01)**				**Number of procedures that require certification: (NIL)**			
OR11.1	Describe and discuss the aetiopathogenesis, clinical features, investigations and principles of management of peripheral nerve injuries in diseases like foot drop, wrist drop, claw hand, palsies of Radial, Ulnar, Median, Lateral Popliteal and Sciatic Nerves	K	K/H	Y	Lecture, Small group discussion, case discussion	Written/ Viva voce/ OSCE		Human Anatomy	General Medicine, General surgery
Topic: Congenital lesions		**Number of competencies : (01)**				**Number of procedures that require certification: (NIL)**			
OR12.1	Describe and discuss the clinical features, investigations and principles of management of Congenital and acquired malformations and deformities of: a. limbs and spine - Scoliosis and spinal bifida b. Congenital dislocation of Hip,Torticollis, c. congenital talipes equino varus	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce/ OSCE		Human Anatomy	
Topic: Procedural Skills		**Number of competencies : (02)**				**Number of procedures that require certification: (NIL)**			

Number	**COMPETENCY** **The student should be able to:**	**Domain K/S/A/C**	**Level K/KH/ SH/P**	**Core (Y/N)**	**Suggested Teaching Learning method**	**Suggested Assessment method**	**Number required to certify P**	**Vertical Integration**	**Horizontal Integration**
OR13.1	Participate in a team for procedures in patients and demonstrating the ability to perform on mannequins / simulated patients in the following: i. Above elbow plaster ii. Below knee plaster iii. Above knee plaster iv. Thomas splint v. splinting for long bone fractures vi. Strapping for shoulder and clavicle trauma	S/A	KH / SH	Y	Case discussion, Video assisted Lecture, Small group discussion, Teaching, Skill lab sessions	OSCE with Simulation based assessment			
OR13.2	Participate as a member in team for Resuscitation of Polytrauma victim by doing all of the following : (a) I.V. access central - peripheral (b) Bladder catheterization (c) Endotracheal intubation (d) Splintage	S/A	KH / SH	Y	Case discussion, Video assisted Lecture, Small group discussion, Teaching, Skill lab sessions	OSCE with Simulation based assessment			Anaesthesiology
Topic: Counselling Skills		**Number of competencies : (03)**				**Number of procedures that require certification: (NIL)**			
OR14.1	Demonstrate the ability to counsel patients regarding prognosis in patients with various orthopedic illnesses like a. fractures with disabilities b. fractures that require prolonged bed stay c. bone tumours d. congenital disabilities	K/S/A/C	KH / SH	Y	Case discussion, Video assisted lecture, Small group discussion, Teaching, Skills lab sessions	OSCE with Simulation based assessment			AETCOM
OR14.2	Demonstrate the ability to counsel patients to obtain consent for various orthopedic procedures like limp amputation, permanent fixations etc..	K/S/A/C	KH / SH	Y	Case discussion, Video assisted Lecture, Small group discussion, Teaching, Skills lab sessions	OSCE with Simulation based assessment			AETCOM

Number	**COMPETENCY** **The student should be able to:**	**Domain K/S/A/C**	**Level K/KH/ SH/P**	**Core (Y/N)**	**Suggested Teaching Learning method**	**Suggested Assessment method**	**Number required to certify P**	**Vertical Integration**	**Horizontal Integration**
OR14.3	Demonstrate the ability to convince the patient for referral to a higher centre in various orthopedic illnesses, based on the detection of warning signals and need for sophisticated management	K/S/A/C	KH / SH	Y	Case discussion, Video assisted Lecture, Small group discussion, Teaching, Skills lab sessions	OSCE with Simulation based assessment			AETCOM
	Column C: K- Knowledge, S – Skill, A - Attitude / professionalism, C- Communication. **Column D: K – Knows, KH - Knows How, SH - Shows how, P- performs independently,** **Column F: DOAP session – Demonstrate, Observe, Assess, Perform.** **Column H: If entry is P: indicate how many procedures must be done independently for certification/ graduation**								
Integration									
	Human Anatomy								
AN2.4	Describe various types of cartilage with its structure & distribution in body	K	KH	Y	Lecture	Written/ Viva voce		Orthopedics	
AN2.5	Describe various joints with subtypes and examples	K	KH	Y	Lecture	Written/ Viva voce		Orthopedics	
AN8.4	Demonstrate important muscle attachment on the given bone	K/S	SH	Y	Practical, DOAP session, Small group teaching	Viva voce/ Practicals		Orthopedics	
AN8.6	Describe scaphoid fracture and explain the anatomical basis of avascular necrosis	K	KH	N	DOAP session	Viva voce		Orthopedics	

Number	**COMPETENCY** **The student should be able to:**	**Domain K/S/A/C**	**Level K/KH/ SH/P**	**Core (Y/N)**	**Suggested Teaching Learning method**	**Suggested Assessment method**	**Number required to certify P**	**Vertical Integration**	**Horizontal Integration**
AN10.12	Describe and demonstrate Shoulder joint for– type, articular surfaces, capsule, synovial membrane, ligaments, relations, movements, muscles involved, blood supply, nerve supply and applied anatomy	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ Skills assessment		Orthopedics	
AN11.4	Describe the anatomical basis of Saturday night paralysis	K	KH	Y	Practical, Lecture	Written/ Viva voce		Orthopedics	
AN17.2	Describe anatomical basis of complications of fracture neck of femur.	K	KH	N	Lecture	Written/ Viva voce		Orthopedics	
AN17.3	Describe dislocation of hip joint and surgical hip replacement	K	KH	N	Lecture	Written/ Viva voce		Orthopedics	
AN18.6	Describe knee joint injuries with its applied anatomy	K	KH	N	Lecture	Written/ Viva voce		Orthopedics	
AN18.7	Explain anatomical basis of Osteoarthritis	K	KH	N	Lecture	Written/ Viva voce		Orthopedics	
AN19.4	Explain the anatomical basis of rupture of calcaneal tendon	K	KH	N	Lecture	Written/ Viva voce		Orthopedics	
AN19.6	Explain the anatomical basis of Flat foot & Club foot	K	KH	N	Lecture	Written/ Viva voce		Orthopedics	
AN19.7	Explain the anatomical basis of Metatarsalgia & Plantar fasciitis	K	KH	N	Lecture	Written/ Viva voce		Orthopedics	
AN50.4	Explain the anatomical basis of Scoliosis, Lordosis, Prolapsed disc, Spondylolisthesis & Spina bifida	K	KH	N	Lecture	Written		Orthopedics	
Pathology									

Number	**COMPETENCY** **The student should be able to:**	**Domain K/S/A/C**	**Level K/KH/ SH/P**	**Core (Y/N)**	**Suggested Teaching Learning method**	**Suggested Assessment method**	**Number required to certify P**	**Vertical Integration**	**Horizontal Integration**
PA33.1	Classify and describe the etiology, pathogenesis, manifestations, radiologic and morphologic features and complications of osteomyelitis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy, Orthopedics	Microbiology
PA33.2	Classify and describe the etiology, pathogenesis, manifestations, radiologic and morphologic features and complications and metastases of bone tumors	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Orthopedics	
PA33.3	Classify and describe the etiology, pathogenesis, manifestations, radiologic and morphologic features and complications and metastases of soft tissue tumors	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Orthopedics	
PA33.4	Classify and describe the etiology, pathogenesis, manifestations, radiologic and morphologic features and complications of Paget's disease of the bone	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Orthopedics	
Microbiology									
MI4.2	Describe the etiopathogenesis, clinical course and discuss the laboratory diagnosis of bone & joint infections.	K	KH	Y	Lecture	Written/ Viva voce		Orthopedics	
Forensic Medicine & Toxicology									
FM3.7	Describe factors influencing infliction of injuries and healing, examination and certification of wounds and wound as a cause of death: Primary and Secondary.	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		Forensic medicicne, Orthopaedics	
FM3.8	Mechanical injuries and wounds: Describe and discuss different types of weapons including dangerous weapons and their examination.	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery, Orthopaedics	

Number	**COMPETENCY** **The student should be able to:**	**Domain K/S/A/C**	**Level K/KH/ SH/P**	**Core (Y/N)**	**Suggested Teaching Learning method**	**Suggested Assessment method**	**Number required to certify P**	**Vertical Integration**	**Horizontal Integration**
FM3.9	Firearm injuries: Describe different types of firearms including structure and components. Along with description of ammunition propellant charge and mechanism of fire-arms, different types of cartridges and bullets and various terminology in relation of firearm – caliber, range, choking.	K	K/KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery, Orthopaedics	
FM3.10	Firearm injuries: Describe and discuss wound ballistics-different types of firearm injuries, blast injuries and their interpretation, preservation and dispatch of trace evidences in cases of firearm and blast injuries, various tests related to confirmation of use of firearms	K	K/KH	Y	Lecture,Small group discussion, Bed side clinic DOAP session	Written/ Viva voce / OSCE		General Surgery, Orthopaedics	
FM3.11	Regional Injuries: Describe and discuss regional injuries to head (Scalp wounds, fracture skull, intracranial haemorrhages, coup and contrecoup injuries), neck, chest, abdomen, limbs, genital organs, spinal cord and skeleton	K	K/KH	Y	Lecture, Small group discussion,Bed side clinic or autopsy, DOAP session	Written/ Viva voce / OSCE/ OSPE		General Surgery, Orthopaedics	
FM3.12	Regional Injuries Describe and discuss injuries related to fall from height and vehicular injuries – Primary and Secondary impact, Secondary injuries, crush syndrome, railway spine.	K	K/KH	Y	Lecture, Small group discussion, Bed side clinic or autopsy, DOAP session	Written/ Viva voce / OSCE/ OSPE		General Surgery, Orthopaedics	
General Medicine									
IM7.5	Develop a systematic clinical approach to joint pain based on the pathophysiology	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Orthopedics
IM7.6	Describe and discriminate acute, subacute and chronic causes of joint pain	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Orthopedics
IM7.7	Discriminate, describe and discuss arthralgia from arthritis and mechanical from inflammatory causes of joint pain	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Orthopedics

Number	**COMPETENCY** **The student should be able to:**	**Domain K/S/A/C**	**Level K/KH/ SH/P**	**Core (Y/N)**	**Suggested Teaching Learning method**	**Suggested Assessment method**	**Number required to certify P**	**Vertical Integration**	**Horizontal Integration**
IM7.8	Discriminate, describe and discuss distinguishing articular from periarticular complaints	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Orthopedics
IM7.9	Determine the potential causes of join pain based on the presenting features of joint involvement	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Orthopedics
IM7.10	Describe the common signs and symptoms of articular and periarticular diseases	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Orthopedics
IM7.13	Perform a systematic examination of all joints, muscle and skin that will establish the diagnosis and severity of disease	S	SH	Y	Bed side clinic, DOAP session	Skill assessment			Orthopedics
IM7.17	Enumerate the indications for arthrocentesis	K	K	Y	small group discussion, Lecture	Written/ Viva voce			Orthopedics
IM7.18	Enumerate the indications and interpret plain radiographs of joints	K	SH	Y	Bed side clinic, small group discussion	Skill assessment/ Written		Radiodiagnosis	Orthopedics
IM7.21	Select, prescribe and communicate appropriate medications for relief of joint pain	K/C	SH	Y	DOAP session	Skill assessment/ Written		Pharmacology	Orthopedics
IM24.12	Describe and discuss the aetiopathogenesis, clinical presentation, identification, functional changes, acute care, stabilization, management and rehabilitation of degenerative joint disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Orthopedics
IM24.13	Describe and discuss the aetiopathogenesis, clinical presentation, identification, functional changes, acute care, stabilization, management and rehabilitation of falls in the elderly	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Orthopedics, Physical Medicine & Rehabilitation
IM24.14	Describe and discuss the aetiopathogenesis, clinical presentation, identification, functional changes, acute care, stabilization, management and rehabilitation of common fractures in the elderly	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Orthopedics

Number	**COMPETENCY** **The student should be able to:**	**Domain K/S/A/C**	**Level K/KH/ SH/P**	**Core (Y/N)**	**Suggested Teaching Learning method**	**Suggested Assessment method**	**Number required to certify P**	**Vertical Integration**	**Horizontal Integration**
IM24.16	Describe and discuss the principles of physical and social rehabilitation, functional assessment, role of physiotherapy and occupational therapy in the management of disability in the elderly	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Orthopedics, Physical Medicine & Rehabilitation
Physical Medicine & Rehabilitation									
PM1.2	Define and describe disability, its cause, and magnitude, identification and prevention of disability	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			General Medicine Orthopedics
PM1.3	Define and describe the methods to identify and prevent disability	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			General Medicine Orthopedics
PM1.4	Enumerate the rights and entitlements of differently abled persons	K	K	Y	Lecture, Small group discussion	Written/ Viva voce			General Medicine, Orthopedics
PM4.1	Describe the common patterns, clinical features, investigations, diagnosis and treatment of common causes of arthritis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			General Medicine Orthopedics
PM4.3	Observe in a mannequin or equivalent the administration of an intra-articular injection	S	KH	N	DOAP session	Skill assessment			Orthopedics
PM4.5	Demonstrate correct assessment of muscle strength and range of movements	S	SH	Y	DOAP session, Bedside clinic	Skill assessment			General Medicine Orthopedics
PM5.1	Enumerate the indications and describe the principles of amputation	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Orthopedics General Surgery
PM5.2	Describe the principles of early mobilization, evaluation of the residual limb, contralateral limb and the influence of co-morbidities	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Orthopedics

Number	**COMPETENCY** **The student should be able to:**	**Domain K/S/A/C**	**Level K/KH/ SH/P**	**Core (Y/N)**	**Suggested Teaching Learning method**	**Suggested Assessment method**	**Number required to certify P**	**Vertical Integration**	**Horizontal Integration**
PM5.3	Demonstrate the correct use of crutches in ambulation and postures to correct contractures and deformities	S	SH	Y	DOAP session, Bedside clinic discussion	Skill assessment			Orthopedics
PM5.4	Identify the correct prosthesis for common amputations	S	SH	Y	DOAP session	Skill assessment / written			Orthopedics
PM6.3	Describe the principles of skin traction, serial casts and surgical treatment including contracture release, tendon transfer, osteotomies and arthrodesis.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Orthopedics
PM6.4	Describe the principles of orthosis for ambulation in PPRP	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Orthopedics
PM7.1	Describe and discuss the clinical features, diagnostic work up, work up diagnosis and management of spinal cord injury	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Orthopedics
PM7.2	Describe and demonstrate process of transfer, applications of collar restraints while maintaining airway and prevention of secondary injury in a mannequin/model	S	SH	Y	DOAP session, Small group discussion	Skill assessment			Orthopedics
PM7.3	Perform and demonstrate a correct neurological examination in a patient with spinal injury and determine the neurologic level of injury	S	SH	Y	Bed side clinic	Skill assessment			Orthopedics
PM7.4	Assess bowel and bladder function and identify common patterns of bladder dysfunction	S	KH	Y	Small group discussion	Written/ Viva voce			General Medicine, Orthopedics
PM7.5	Enumerate the indications and identify the common mobility aids and appliances, wheel chairs	S	S	Y	DOAP session	Skill assessment/ Viva voce			Orthopedics

Number	**COMPETENCY** **The student should be able to:**	**Domain K/S/A/C**	**Level K/KH/ SH/P**	**Core (Y/N)**	**Suggested Teaching Learning method**	**Suggested Assessment method**	**Number required to certify P**	**Vertical Integration**	**Horizontal Integration**
PM7.7	Enumerate and describe common life threatening complications following SCI like Deep vein Thrombosis, Aspiration Pneumonia, Autonomic dysreflexia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			General Medicine, Orthopedics
PM8.1	Describe the clinical features, evaluation, diagnosis and management of disability following traumatic brain injury	K	KH	Y	Lecture, Small group discussion	Written / Viva voce			General Medicine, Orthopedics, General Surgery

ANAESTHESIOLOGY (CODE: AS)

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal integration
ANAESTHESIOLOGY									
Topic: Anaesthesiology as a specialty		**Number of competencies: (04)**				**Number of procedures that require certification: (NIL)**			
AS1.1	Describe the evolution of Anaesthesiology as a modern specialty	K	K	N	Lecture	Written/ Viva voce			
AS1.2	Describe the roles of Anaesthesiologist in the medical profession (including as a peri-operative physician, in the intensive care and high dependency units, in the management of acute and chronic pain, including labour analgesia, in the resuscitation of acutely ill)	K	K	N	Lecture	Written/ Viva voce			
AS1.3	Enumerate and describe the principle of ethics as it relates to Anaesthesiology	K	K	N	Lecture	Written/ Viva voce		AETCOM	
AS1.4	Describe the prospects of Anaesthesiology as a career	K	K	N	Lecture	Written/ Viva voce			
Topic: Cardiopulmonary resuscitation		**Number of competencies: (02)**				**Number of procedures that require certification : (NIL)**			
AS2.1	Enumerate the indications, describe the steps and demonstrate in a simulated environment, Basic Life Support in adults, children and neonates	K/S	SH	N	DOAP session	Skill assessment		General Medicine, Pediatrics	
AS2.2	Enumerate the indications, describe the steps and demonstrate in a simulated environment, Advanced Life Support in adults and children	S	SH	N	DOAP session	Skill assessment		General Medicine	
Topic: Preoperative evaluation and medication		**Number of competencies: (06)**				**Number of procedures that require certification : (NIL)**			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal integration
AS3.1	Describe the principles of preoperative evaluation	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			General Surgery, General Medicine
AS3.2	Elicit, present and document an appropriate history including medication history in a patient undergoing Surgery as it pertains to a preoperative anaesthetic evaluation	S	SH	Y	DOAP session, Bedside clinic	Skill station			General Surgery, General Medicine
AS3.3	Demonstrate and document an appropriate clinical examination in a patient undergoing General Surgery	S	SH	Y	DOAP session, Bedside clinic	Skill station			General Surgery, General Medicine
AS3.4	Choose and interpret appropriate testing for patients undergoing Surgery	S	SH	Y	DOAP session, Bedside clinic	Skill station			General Surgery, General Medicine
AS3.5	Determine the readiness for General Surgery in a patient based on the preoperative evaluation	S	SH	Y	DOAP session, Bedside clinic	Skill station			General Surgery, General Medicine
AS3.6	Choose and write a prescription for appropriate premedications for patients undergoing surgery	S	SH	Y	DOAP session, Bedside clinic	Skill station		Pharmacology	
Topic: General Anaesthesia		**Number of competencies: (07)**				**Number of procedures that require certification : (NIL)**			
AS4.1	Describe and discuss the pharmacology of drugs used in induction and maintenance of general anaesthesia (including intravenous and inhalation induction agents, opiate and non-opiate analgesics, depolarising and non depolarising muscle relaxants, anticholinesterases)	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pharmacology	
AS4.2	Describe the anatomy of the airway and its implications for general anaesthesia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy	
AS4.3	Observe and describe the principles and the practical aspects of induction and maintenance of anesthesia	S	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce		Pharmacology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal integration
AS4.4	Observe and describe the principles and the steps/ techniques in maintenance of vital organ functions in patients undergoing surgical procedures	S	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce			
AS4.5	Observe and describe the principles and the steps/ techniques in monitoring patients during anaesthesia	S	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce			
AS4.6	Observe and describe the principles and the steps/ techniques involved in day care anesthesia	S	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce			
AS4.7	Observe and describe the principles and the steps/ techniques involved in anaesthesia outside the operating room	S	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce			
Topic: Regional anaesthesia		**Number of competencies: (06)**				**Number of procedures that require certification: (NIL)**			
AS5.1	Enumerate the indications for and describe the principles of regional anaesthesia (including spinal, epidural and combined)	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
AS5.2	Describe the correlative anatomy of the brachial plexus, subarachnoid and epidural spaces	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy	
AS5.3	Observe and describe the principles and steps/ techniques involved in peripheral nerve blocks	S	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce		Human Anatomy	
AS5.4	Observe and describe the pharmacology and correct use of commonly used drugs and adjuvant agents in regional anesthesia	S	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce		Pharmacology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal integration
AS5.5	Observe and describe the principles and steps/ techniques involved in caudal epidural in adults and children	S	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce			
AS5.6	Observe and describe the principles and steps/ techniques involved in common blocks used in surgery (including brachial plexus blocks)	S	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce			General Surgery
Topic: Post-anaesthesia recovery		**Number of competencies: (03)**				**Number of procedures that require certification: (NIL)**			
AS6.1	Describe the principles of monitoring and resuscitation in the recovery room	S	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce			
AS6.2	Observe and enumerate the contents of the crash cart and describe the equipment used in the recovery room	S	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce			
AS6.3	Describe the common complications encountered by patients in the recovery room, their recognition and principles of management	K	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce			General Surgery
Topic: Intensive Care Management		**Number of competencies: (05)**				**Number of procedures that require certification: (NIL)**			
AS7.1	Visit, enumerate and describe the functions of an Intensive Care Unit	S	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce			
AS7.2	Enumerate and describe the criteria for admission and discharge of a patient to an ICU	S	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce			General Medicine
AS7.3	Observe and describe the management of an unconscious patient	S	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce		Physiology	General Medicine

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal integration
AS7.4	Observe and describe the basic setup process of a ventilator	S	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce		Physiology	General Medicine
AS7.5	Observe and describe the principles of monitoring in an ICU	S	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce			General Medicine
Topic: Pain and its management		**Number of competencies: (05)**				**Number of procedures that require certification: (NIL)**			
AS8.1	Describe the anatomical correlates and physiologic principles of pain	K	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce		Human Anatomy, Physiology	
AS8.2	Elicit and determine the level, quality and quantity of pain and its tolerance in patient or surrogate	S	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce		Physiology	
AS8.3	Describe the pharmacology and use of drugs in the management of pain	K	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce		Pharmacology	
AS8.4	Describe the principles of pain management in palliative care	K	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce		Pharmacology	General Medicine
AS8.5	Describe the principles of pain management in the terminally ill	K	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce		Pharmacology	General Medicine
Topic: Fluids		**Number of competencies: (04)**				**Number of procedures that require certification: (NIL)**			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal integration
AS9.1	Establish intravenous access in a simulated environment	S	KH	Y	Small group discussion, DOAP session	Skill assessment			
AS9.2	Establish central venous access in a simulated environment	S	KH	Y	Small group discussion, DOAP session	Skill assessment			
AS9.3	Describe the principles of fluid therapy in the preoperative period	K	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce			General Surgery
AS9.4	Enumerate blood products and describe the use of blood products in the preoperative period	K	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce		Pathology	General Surgery
Topic: Patient safety		**Number of competencies: (04)**				**Number of procedures that require certification: (NIL)**			
AS10.1	Enumerate the hazards of incorrect patient positioning	K	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce			
AS10.2	Enumerate the hazards encountered in the perioperative period and steps/techniques taken to prevent them	K	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce			
AS10.3	Describe the role of communication in patient safety	K	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce		AETCOM	General Surgery
AS10.4	Define and describe common medical and medication errors in anaesthesia	K	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce		Pharmacology	General Medicine

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal integration
	Column C: K- Knowledge, S – Skill, A - Attitude / professionalism, C- Communication. **Column D: K – Knows, KH - Knows How, SH - Shows how, P- performs independently,** **Column F: DOAP session – Demonstrate, Observe, Assess, Perform.** **Column H: If entry is P: indicate how many procedures must be done independently for certification/ graduation**								
Integration									
	Physiology								
PY3.4	Describe the structure of neuro-muscular junction and transmission of impulses	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Anaesthesiology	
PY3.5	Discuss the action of neuro-muscular blocking agents	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Anaesthesiology Pharmacology	
PY11.14	Demonstrate Basic Life Support in a simulated environment	S	SH	Y	DOAP sessions	OSCE		General Medicine Anaesthesiology	
	Pharmacology								
PH1.15	Describe mechanism/s of action, types, doses, side effects, indications and contraindications of skeletal muscle relaxants	K	KH	Y	Lecture	Written/ Viva voce		Anesthesiology, Physiology	
PH1.17	Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of local anaesthetics	K	KH	Y	Lecture	Written/ Viva voce		Anesthesiology	
PH1.18	Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of general anaesthetics, and pre-anaesthetic medications	K	KH	Y	Lecture	Written/ Viva voce		Anesthesiology	
	Forensic Medicine & Toxicology								

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal integration
FM2.19	Investigation of anaesthetic, operative deaths: Describe and discuss special protocols for conduction of autopsy and for collection, preservation and dispatch of related material evidences	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Anesthesiology, General Surgery	
General Medicine									
IM13.17	Describe and enumerate the indications, use, side effects of narcotics in pain alleviation in patients with cancer	K	KB	Y	Bedside clinic, small group discussion	short note/ Viva voce		Pharmacology	Anesthesiology
IM24.11	Describe and discuss the aetiopathogenesis, clinical presentation, identification, functional changes, acute care, stabilization, management and rehabilitation of the elderly undergoing surgery	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Anesthesiology General Surgery
General Surgery									
SU11.1	Describe principles of Preoperative assessment.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Anesthesiology
SU11.2	Enumerate the principles of general, regional, and local Anaesthesia.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Anesthesiology
SU11.3	Demonstrate maintenance of an airway in a mannequin or equivalent	S	SH	Y	DOAP session	Skill Assessment			Anesthesiology
SU11.5	Describe principles of providing post-operative pain relief and management of chronic pain.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Anesthesiology
SU17.2	Demonstrate the steps in Basic Life Support. Transport of injured patient in a simulated environment	S	SH	Y	DOAP session	Skill assessment			Anesthesiology

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal integration
SU17.10	Demonstrate Airway maintenance and recognize and management of tension pneumothorax, hemothorax and flail chest in simulated environment	S	SH	Y	DOAP session	Skill Assessment/ Log book			Anesthesiology
Orthopaedics									
OR1.1	Describe and discuss the Principles of Pre hospital care and Casuality management of a trauma victim including principles of triage,	K/S/A/C	K, KH	Y	Lecture with video, Small group Discussion	Written/ Viva voce/ OSCE/ Simulation			General Surgery Anaesthesiology
OR13.2	Participate as a member in team for Resuscitation of Polytrauma victim by doing all of the following : (a) IV. access central - peripheral (b) Bladder catheterization (c) Endotracheal intubation (d) Splintage	S/A	KH / SH	Y	Case discussion, Video assisted Lecture, Small group discussion, Teaching, Skill lab sessions	OSCE with Simulation based assessment			Anaesthesiology

RADIODIAGNOSIS (CODE: RD)

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
RADIODIAGNOSIS									
Topic: Radiological investigations and Radiation safety		**Number of competencies: (13)**			**Number of procedures that require certification: (NIL)**				
RD1.1	Define radiation and the interaction of radiation and importance of radiation protection	K	KH	Y	Lecture, Demonstration				
RD1.2	Describe the evolution of Radiodiagnosis. Identify various radiological equipments In the current era	S	SH	Y	Lecture, Demonstration				
RD1.3	Enumerate indications for various common radiological investigations, choose the most appropriate and cost effective method and interpret findings in common conditions pertaining to disorder of ENT	K/S	SH	Y	Lecture, Demonstration				
RD1.4	Enumerate indications for various common radiological investigations, choose the most appropriate and cost effective method and interpret findings in common conditions pertaining to disorder in Ob & Gy	K/S	SH	Y	Lecture, Demonstration				
RD1.5	Enumerate indications for various common radiological investigations, choose the most appropriate and cost effective method and interpret findings in common conditions pertaining to disorder in internal medicine	K/S	SH	Y	Lecture, Demonstration				
RD1.6	Enumerate indications for various common radiological investigations, choose the most appropriate and cost effective method and interpret findings in common conditions pertaining to disorderls in surgery	K/S	SH	Y	Lecture, Demonstration				
RD1.7	Enumerate indications for various common radiological investigations, choose the most appropriate and cost effective method and interpret findings in common conditions pertaining to disorder in Pediatrics	K/S	SH	Y	Lecture, Demonstration				

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
RD1.8	Enumerate indications for various common radiological investigations, choose the most appropriate and cost effective method and interpret findings in common conditions pertaining to common malignancies	K/S	SH	Y	Lecture, Demonstration				
RD1.9	Describe the role of Interventional Radiology in common clinical conditions	K	KH	Y	Lecture, Demonstration				
RD1.10	Describe the role of Emergency Radiology, miscellaneous & applied aspects, interaction with clinical departments	K	KH	Y	Lecture, Demonstration				
RD1.11	Describe preparation of patient for common imaging procedures	K	KH	Y	Lecture, Demonstration				
RD1.12	Describe the effects of radiation in pregnancy and the methods of prevention/ minimization of radiation exposure	K	KH	Y	Lecture, Demonstration				
RD1.13	Describe the components of the PC & PNDT Act and its medicolegal implications	K	KH	Y	Lecture, Small group discussion			Obstetrics & Gynaecology, Forensic Medicine & Toxicology	
	Column C: K- Knowledge, S – Skill, A - Attitude / professionalism, C- Communication. **Column D: K – Knows, KH - Knows How, SH - Shows how, P- performs independently,** **Column F: DOAP session – Demonstrate, Observe, Assess, Perform.** **Column H: If entry is P: indicate how many procedures must be done independently for certification/ graduation**								
Integration									
	Human Anatomy								
AN13.4	Identify the bones and joints of upper limb seen in anteroposterior and lateral view radiographs of shoulder region, arm, elbow, forearm and hand	K/S	SH	Y	Practical, Small group discussion, DOAP session	Viva voce/ Skill assessment		Radiodiagnosis	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
AN20.6	Identify the bones and joints of lower limb seen in anteroposterior and lateral view radiographs of various regions of lower limb	K/S	SH	Y	Lecture, Small group discussion, DOAP session	Viva voce/ Skill assessment		Radiodiagnosis	
AN25.7	Identify structures seen on a plain x-ray chest (PA view)	K/S	SH	Y	Practical, DOAP session	Written/ Viva voce		Radiodiagnosis, General Medicine	
AN25.8	Identify and describe in brief a barium swallow	K/S	SH	N	Practical, DOAP session	Written/ Viva voce		Radiodiagnosis, General Medicine	
AN43.7	Identify the anatomical structures in 1) Plain x ray skull, 2) AP view and lateral view 3) Plain x ray cervical spine - AP and lateral view 4) Plain x ray of paranasal sinuses	K/S	SH	Y	Practical	Viva voce/ Skill assessment		Radiodiagnosis	
AN43.8	Describe the anatomical route used for carotid angiogram and vertebral angiogram	K/S	SH	N	Practical	Viva voce/ Skill assessment		Radiodiagnosis	
AN43.9	Identify anatomical structures in carotid angiogram and vertebral angiogram	K/S	SH	N	Practical	Viva voce/ Skill assessment		Radiodiagnosis	
AN51.1	Describe & identify the cross-section at the level of T8, T10 and L1 (transpyloric plane)	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ Skill assessment		Radiodiagnosis	
AN51.2	Describe & identify the midsagittal section of male and female pelvis	K	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ Skill assessment		Radiodiagnosis	
AN541.	Describe & identify features of plain X ray abdomen	K/S	SH	Y	Lecture, DOAP session	Viva voce/ Skill assessment		Radiodiagnosis	
AN54.2	Describe & identify the special radiographs of abdominopelvic region (contrast X ray Barium swallow, Barium meal, Barium enema, Cholecystography, Intravenous pyelography &Hysterosalpingography)	K/S	SH	Y	Lecture, DOAP session	Viva voce/ Skill assessment		Radiodiagnosis	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
AN54.3	Describe role of ERCP, CT abdomen, MRI, Arteriography in radiodiagnosis of abdomen	K	KH	N	Lecture	Viva voce		Radiodiagnosis	
Forensic Medicine & Toxicology									
FM1.9	Describe the importance of documentation in medical practice in regard to medicolegal examinations, Medical Certificates and medicolegal reports especially: – maintenance of patient case records, discharge summary, prescribed registers to be maintained in Health Centres. -- maintenance of medico-legal register like accident register. -- documents of issuance of wound certificate -- documents of issuance of drunkenness certificate. -- documents of issuance of sickness and fitness certificate. -- documents for issuance of death certificate. -- documents of Medical Certification of Cause of Death - Form Number4 and 4A -- documents for estimation of age by physical, dental and radiological examination and issuance of certificate	K	KH	Y	Lecture/ Small group discussion	Written/ Viva voce		Radiodiagnosis, General Surgery, General Medicine, Pediatrics	
General Medicine									
IM1.19	Enumerate the indications for and describe the findings of heart failure with the following conditions including: 2D echocardiography, brain natriuretic peptide, exercise testing, nuclear medicine testing and coronary angiogram	S	KH	N	Lecture, Small group discussion, Bedside clinic	Skill assessment		Radiodiagnosis	
IM3.7	Order and interpret diagnostic tests based on the clinical presentation including: CBC, Chest X ray PA view, Mantoux, sputum gram stain, sputum culture and sensitivity, pleural fluid examination and culture, HIV testing and ABG	S	SH	Y	Bedside clinic, DOAP session	Skill assessment		Radiodiagnosis, Microbiology	
IM3.11	Describe and enumerate the indications for further testing including HRCT, Viral cultures, PCR and specialised testing	S	SH	Y	Bedside clinic, DOAP session	Skill assessment		Radiodiagnosis, Microbiology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
IM5.13	Enumerate the indications for ultrasound and other imaging studies including MRCP and ERCP and describe the findings in liver disease	K	K	Y	Bedside clinic,Small group discussion	Viva voce/ Written		Radiodiagnosis	General Surgery
IM6.12	Enumerate the indications and describe the findings for CT of the chest and brain and MRI	K	K	N	Small group discussion, Lecture, Bedside clinic	Written/ Viva voce		Radiodiagnosis	
IM7.18	Enumerate the indications and interpret plain radiographs of joints	K	SH	Y	Bedside clinic, Small group discussion	Skill assessment/ Written		Radiodiagnosis	Orthopedics
IM10.19	Enumerate the indications and describe the findings in renal ultrasound	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Radiodiagnosis	
IM13.12	Describe the indications and interpret the results of Chest X Ray, mammogram, skin and tissue biopsies and tumor markers used in common cancers	K	KH	Y	Bedside clinic, Small group discussion	Short note/ Viva voce		Radiodiagnosis	
IM18.9	Choose and interpret the appropriate diagnostic and imaging test that will delineate the anatomy and underlying cause of the lesion	S	KH	Y	Bedside clinic, DOAP session, Small group discussion	Written/ Viva voce/ Skill assessment		Radiodiagnosis	
IM19.7	Choose and interpret diagnostic and imaging tests in the diagnosis of movement disorders	S	SH	Y	Bedside clinic, Small group discussion	Skill assessment/ Small group session/ Written/ Viva voce		Radiodiagnosis	
Obstetrics & Gynaecology									
OG9.4	Discuss the clinical features, laboratory investigations ultrasonography, differential diagnosis, principles of management and follow up of gestational trophoblastic neoplasms	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Radiodiagnosis
Pediatrics									
PE21.12	Interpret report of Plain radiograph of KUB	S	SH	Y	Bedside clinics, Skills lab	Log book		Radiodiagnosis	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PE21.13	Enumerate the indications for and Interpret the written report of Ultra sonogram of KUB	S	SH	Y	Bedside clinics, Skills lab	Log book		Radiodiagnosis	
PE23.13	Interpret a chest radiograph and recognize Cardiomegaly	S	SH	Y	Bedside clinics, Skills lab	Log book entry		Radiodiagnosis	
PE23.16	Use the ECHO reports in management of cases	S	SH	Y	Bedside clinics	Log book entry		Radiodiagnosis	
PE28.17	Interpret X-ray of the paranasal sinuses and mastoid; and /or use written report in case of management Interpret CXR in foreign body aspiration and lower respiratory tract infection, understand the significance of thymic shadow in Pediatric chest X-rays	S	P	Y	Bedside clinics, Small group discussion	Skills Assessment	3	ENT, Radiodiagnosis	
PE30.23	Interpret the reports of EEG, CT, MRI	S	SH	Y	Bedside clinics, Skill lab	Log book		Radiodiagnosis	
PE34.8	Interpret a Chest radiograph	S	SH	Y	Bedside clinics, Skill lab	Skill assessment		Radiodiagnosis	Respiratory Medicine
General Surgery									
SU25.3	Describe the etiopathogenesis, clinical features, Investigations and principles of treatment of benign and malignant tumours of breast.	K	KH	Y	Lecture, Small group discussion, Demonstration	Written/ Viva voce Skill assessment		Radiodiagnosis	

RADIOTHERAPY (CODE: RT)

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/N	Suggested teaching learning method	Suggested assessment method	Number required to certify P	Vertical integration	Horizontal integration
RADIOTHERAPY									
Topic: Principles of Radiation Oncology (Radiotherapy)		**Number of competencies: (03)**				**Number of procedures that require certification : (NIL)**			
RT1.1	Describe and discuss definition of radiation, mechanism of action of radiation, types of radiation	K	KH	Y	Lecture	Written/ Viva voce			General Surgery, Anaesthesiology
RT1.2	Describe and discuss interaction of radiation with matter & measurement of radiation	K	KH	Y	Lecture	Written/ Viva voce			
RT1.3	Enumerate, describe and discuss classification and staging of cancer (AJCC, FIGO etc.)	K	KH	Y	Lecture	Written/ Viva voce		Pathology	General Surgery, General Medicine
Topic: Radiation Protection		**Number of competencies: (01)**				**Number of procedures that require certification : (NIL)**			
RT2.1	Describe and discuss radiation protection and personnel monitoring during radiation treatment	K	KH	Y	Lecture	Written/ Viva voce			
Topic: Radiobiology & Chemoradiation		**Number of competencies: (02)**				**Number of procedures that require certification : (NIL)**			
RT3.1	Describe and discuss cell cycle and cell survival curve, principles of radiobiology	K	KH	Y	Lecture	Written/ Viva voce			
RT3.2	Describe and discuss synergism of radiation and chemotherapy	K	KH	Y	Lecture	Written/ Viva voce			
Topic: Radiation Treatment Delivery & outcome		**Number of competencies: (09)**				**Number of procedures that require certification : (NIL)**			
RT4.1	Describe and discuss teletherapy machine (Co60/LINAC)	K	KH	Y	DOAP session	Written/ Viva voce			
RT4.2	Enumerate, describe and discuss types of treatment plan, basic workflow of 2D/3DCRT/IMRT/IGRT	K	KH	Y	DOAP session	Written/ Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/N	Suggested teaching learning method	Suggested assessment method	Number required to certify P	Vertical integration	Horizontal integration
RT4.3	Describe and discuss Brachytherapy machine (remote after loading)	K	KH	Y	DOAP session	Written/ Viva voce			
RT4.4	Describe and discuss different radioactive isotopes and their use in cancer patients	K	KH	Y	Lecture	Written/ Viva voce			
RT4.5	Describe and discuss role of radiation in management of common malignancies in India (region specific)	K	KH	Y	Lecture and Bed side clinics	Written/ Viva voce		Pathology	General Surgery, Obstetrics & Gynaecology
RT4.6	Describe and discuss radiotherapy for benign disease	K	KH	Y	Lecture	Written/ Viva voce		Pathology	General Surgery, Obstetrics & Gynaecology
RT4.7	Counsel patients regarding acute and late effects of radiation and supportive care	K/A/S	KH	Y	Bed side clinic, group discussion	Written/ Viva voce		Pathology	General Surgery, Obstetrics & Gynaecology
RT4.8	Describe oncological emergencies and palliative care	K/A/S	K/KH	Y	Lecture, group discussion	Written/ Viva voce			General Surgery, Obstetrics & Gynaecology
RT4.9	Display empathy in the care of patients with cancer	A	SH	N				AETCOM	
Topic: Cancer Prevention & Registries		**Number of competencies: (01)**				**Number of procedures that require certification : (NIL)**			
RT5.1	Describe and discuss cancer prevention, screening, vaccination, cancer registry	K	K	Y	Group discussion	Written/ Viva voce		Pathology	General Surgery, Obstetrics & Gynaecology

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Column D: K – Knows, KH - Knows How, SH- Shows how, P- performs independently,
Column F: DOAP session – Demonstrate, Observe, Assess, Perform.
Column H: If entry is P: indicate how many procedures must be done independently for certification/ graduation

Integration

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core Y/N	Suggested teaching learning method	Suggested assessment method	Number required to certify P	Vertical integration	Horizontal integration
				Orthopaedics					
OR10.1	Describe and discuss the aetiopathogenesis, Clinical features, Investigations and principles of management of benign and malignant bone tumours and pathological fractures	K	K/KH	Y	Lecture, Small group discussion, Video assisted interactive lecture	Written/ Viva voce/ OSCE		Pathology	General Surgery, Radiotherapy

DENTISTRY (CODE: DE)

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
DENTISTRY									
Topic: Dental Caries		**Number of competencies: (05)**				**Number of procedures that require certification (NIL)**			
DE1.1	Enumerate the parts of the tooth	K	K	N	Lecture, Small group discussion	Viva voce		Human Anatomy	
DE1.2	Discuss the role of causative microorganisms in the aetio-pathogenesis of dental caries	K	KH	Y	Lecture, Small group discussion	Viva voce		Microbiology	
DE1.3	Identify Dental caries	S	SH	N	Observation, Bed side clinics	Skill assessment			
DE1.4	Discuss the role of dental caries as a focus of sepsis	K	KH	Y	Lecture, Small group discussion	Viva voce		Microbiology, General Medicine	
DE1.5	Counsel patients with respect to oral hygiene, diet and the direct bearing on systemic health	A/C	SH	Y	DOAP session	Document in Log book			
Topic: Edentulous state		**Number of competencies: (05)**				**Number of procedures that require certification (NIL)**			
DE2.1	Discuss the various causes for partial /complete loss of teeth and associated structures	K	K	N	Lecture, Small group discussion	Viva voce			
DE2.2	Discuss the local and systemic sequelae of the above	K	KH	Y	Lecture, Small group discussion	Viva voce			
DE2.3	Identify complete complement of teeth and identify missing teeth	S	SH	N	Observation, Bed side clinics	Skill assessment			
DE2.4	Enumerate common ways of restoring the edentulous state	K	KH	Y	Lecture, Small group discussion	Viva voce			
DE2.5	Counsel patients on the importance of restoring missing teeth/tissues with respect to the benefits on oral and systemic health.	A/C	SH	Y	DOAP session	Document in Log book			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
Topic: Malocclusion		**Number of competencies: (04)**				**Number of procedures that require certification: (NIL)**			
DE3.1	Aware of malocclusion and the tissues that cause it	K	K	N	Lecture, Small group discussion	Viva voce			
DE3.2	Enumerate the impact of malocclusion on aesthetics, health	K	KH	Y	Lecture, Small group discussion	Viva voce			
DE3.3	Identify malocclusion	S	SH	N	Observation, Bedside clinics	Skill assessment			
DE3.4	Counsel patients with respect to correction of malocclusion and the role it might have on oral health specifically on the TMJ	A/C	SH	Y	DOAP session	Document in Log book			
Topic: Oral cancer		**Number of competencies: (04)**				**Number of procedures that require certification: (NIL)**			
DE4.1	Discuss the prevalence of oral cancer and enumerate the common types of cancer that can affect tissues of the oral cavity	K	K	N	Lecture, Small group discussion	Viva voce		Pathology	ENT
DE4.2	Discuss the role of etiological factors in the formation of precancerous /cancerous lesions	K	KH	Y	Lecture, Small group discussion	Viva voce		Pathology	ENT
DE4.3	Identify potential pre-cancerous /cancerous lesions	S	SH	N	Observation, Bed side clinics	Skill assessment		Pathology	ENT
DE4.4	Counsel patients to risks of oral cancer with respect to tobacco, smoking, alcohol and other causative factors.	A/C	SH	Y	DOAP session	Document in Log book		Pathology	ENT
Topic: Periodontal disease		**Number of competencies: (05)**				**Number of procedures that require certification: (NIL)**			
DE5.1	Enumerate the parts of the tooth and supporting structures	K	K	N	Lecture, Small group discussion	Viva voce		Human Anatomy	
DE5.2	Enumerate the common diseases that affect the periodontium and identify local and systemic causative factors	K	KH	Y	Lecture, Small group discussion	Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
DE5.3	Identify Periodontal disease	S	SH	N	Observation, Bedside clinics	Skill assessment			
DE5.4	Discuss the role of Periodontal disease as a focus of sepsis	K	KH	Y	Lecture, Small group discussion	Viva voce			
DE5.5	Counsel patients with respect to oral hygiene, diet and the direct bearing on systemic health and vice versa	A/C	SH	Y	DOAP session	Document in Log book			

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Column D: K – Knows, KH - Knows How, SH - Shows how, P- performs independently,
Column F: DOAP session – Demonstrate, Observe, Assess, Perform.
Column H: If entry is P: indicate how many procedures must be done independently for certification/ graduation

Integration									
					Pathology				
PA24.1	Describe the etiology, pathogenesis, pathology and clinical features of oral cancers	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Dentistry	

List of contributing subject Experts

1. Human Anatomy

- Dr. Praveen R Singh, Professor & Head, Department of Anatomy, Pramukhswami Medical College, Karamsad, Gujarat
- Dr. Nachiket Shankar, Associate Professor, Department of Anatomy, St. John's Medical College & Hospital, Bangalore

2. Physiology

- Dr. Mario Vaz, Professor, Department of Physiology, St. John's Medical College & Hospital, Bangalore
- Dr. Jayashree Sengupta, Former Professor & Head, Department of Physiology, All India Institute of Medical Sciences, New Delhi.
- Dr Hasmukh D Shah, Professor & Head, Department of Physiology, Pramukhswami Medical College, Karamsad, Gujarat

3. Biochemistry

- Dr. Nibhriti Das, Professor, Department of Biochemistry, All India Institute of Medical Sciences, New Delhi
- Dr. S. P. Singh, Professor, Department of Biochemistry, Maharani Laxmi Bai Medical College, Jhansi, Uttar Pradesh
- Dr. Hitesh N Shah, Professor & Head, Department of Biochemistry, Pramukhswami Medical College, Karamsad, Gujarat

4. Pharmacology

- Dr. S. K. Maulik, Professor, Department of Pharmacology, All India Institute of Medical Sciences, New Delhi
- Dr. Vandana Roy, Professor, Department of Pharmacology, Maulana Azad Medical College, New Delhi

5. Pathology

- Dr. S. Datta Gupta, Professor, Department of Pathology, All India Institute of Medical Sciences, New Delhi
- Dr. Uma Chaturvedi, Professor, C-1303, Freedom Park Life, Sector- 57, Gurugram

6. Microbiology

- Dr. S. Geetalakshmi, Dean, Professor, Department of Microbiology, Stanley Medical College, Chennai, Tamil Nadu.
- Dr. Padma Srikanth, Professor, Department of Microbiology, Sri Ramachandra Medical College & Research Institute, Chennai
- Dr. Suman Singh, Professor, Department of Microbiology, Pramukhswami Medical College, Karamsad, Gujarat

7. Forensic Medicine & Toxicology

- Dr. Sanjeev Lalwani, Professor & Registrar (Academics), Department of Forensic Medicine, All India Institute of Medical Sciences, New Delhi
- Dr. T. D. Dogra, Former Director & Former Head, Department of Forensic Medicine, All India Institute of Medical Sciences, New Delhi; currently, Vice Chancellor, SGT University, Gurugram
- Col. Ravi Rautji, Professor & Head, Department of Forensic Medicine, Commanding Officer, Directorate General of Medical Services (Army), New Delhi
- Dr. S.D. Nanandkar, Professor & Head, Department of Forensic Medicine, Grant Government Medical College & Sir J.J. Group of Hospitals, Mumbai
- Dr. Indrajit L. Khandekar, In-charge CFMU and Associate Professor, Department of Forensic Medicine & Toxicology, MGIMS and Kasturba Hospital, Sewagram, Wardha.
- Dr. S. B. Punpale, Professor & Head, Department of Forensic Medicine, B. J. Medical College, Pune, Maharashtra

8. Community Medicine

- Dr. B. S. Garg, Professor & Head, Department of Community Medicine, Mahatama Gandhi Institute of Medical Sciences, Wardha, Sewagram, Maharashtra
- Dr. Umesh Kapil, Professor, Department of Community Medicine, All India Institute of Medical Sciences, New Delhi
- Dr. Sanjay Zodpey, Director, Public Health Foundation of India, Isid Campus, 4 Institutional Area, Vasant Kunj, New Delhi
- Dr. Saudan Singh, Professor, Department of Community Medicine, Vardhman Mahavir Medical College & Safdarjung Hospital, New Delhi
- Dr. Dinesh Kumar, Professor, Department of Community Medicine, Pramukhswami Medical College, Karamsad, Gujarat
- Dr. Pankaj B. Shah, Professor, Deartment of Community Medicine, Sri Ramachandra Medical College & Research Institute, Chennai.

9. General Medicine & Respiratory Medicine

- Dr. Krishna G. Seshadri, Visiting Professor, Endocrinology & Metabolism, Balaji Vidyapeeth, Puducherry
- Dr. M. K. Bhatnagar, Director Professor, Department of General Medicine, Lady Hardinge Medical College, New Delhi
- Dr. Aparna Agarwal, Director Professor of Medicine, Lady Hardinge Medical College, New Delhi
- Dr. Anil Gurtoo, Director Professor of Medicine, Lady Hardinge Medical College, New Delhi

10. Pediatrics

- Dr. Harish Chellani, Professor of Pediatrics, Vardhman Mahavir Medical College & Safdarjung Hospital, New Delhi
- Dr. A. K. Dutta, Former Head, Kalawati Saran Children's Hospital, New Delhi

- Dr. S. Aneja, Director Professor & Head, Department of Pediatrics, Kalawati Saran Children's Hospital, New Delhi
- Dr. Latha Ravichandran, Professor, Deartment of Paediatrics, Sri Ramachandra Medical College & Research Institute, Chennai.

11. Psychiatry

- Dr. Rakesh Kumar Chadda, Department of Psychiatry, All India Institute of Medical Sciences, New Delhi
- Dr. N. M. Patil, Professor, Department of Psychiatry, Jawaharlal Nehru Medical College, Belagavi
- Dr. Rajesh Rastogi, Consultant & Head Department of Psychiatry, Vardhman Mahavir Medical College & Safdarjung Hospital, New Delhi.
- Dr. Jagdish R Varma, Associate Professor, Department of Psychiatry, Pramukhswami Medical College, Karamsad, Gujarat

12. Dermatology, Venereology & Leprosy

- Dr. R. K. Gautam, Professor, Department of Dermatology, Venereology & Leprosy, Dr. Ram Manohar Lohia Hospital, New Delhi.
- Dr. Sujay Khandpur, Professor, Department of Dermatology, Venereology & Leprosy, All India Institute of Medical Sciences, New Delhi
- Dr. S. Murugan, Associate Professor of Dermatology, Sri Ramachandra Medical College & Research Institute, Chennai

13. Physical Medicine and Rehabilitation

- Dr. Sanjay Wadhwa, Professor, Department of Physical Medicine & Rehabilitation, All India Institute of Medical Sciences, New Delhi
- Dr. George Tharion, Head, Department of Physical Medicine & Rehabilitation, Christian Medical College, Vellore, Tamil Nadu

- Dr. Jagdish Menon, Professor & Head, Department of Orthopaedics and Dept. of Physical & Rehabilitative Medicine, Jawaharlal Institute of Postgraduate Medical Education and Research, Pondicherry

14. General Surgery

- Dr. N Ananthakrishnan, 2A Vairam Enclave, Siddhananda Nagar, Pondicherry -605005.
- Dr. P. V. Chalam, Former Professor, Department of Surgery, Gandhi Medical College, Secunderabad, Telengana.
- Dr. Dinesh Bhatnagar, Professor, Department of General Surgery, North Delhi Municipal Corporation Medical College, Hindu Rao Hospital, Malka Ganj, Delhi

15. Ophthalmology

- Dr. Smita Singh, Professor, Department of Ophthalmology, Mahatma Gandhi Institute of Medical Sciences, Wardha

16. Oto-rhino-laryngology

- Dr. Achal Gulati, Director Professor, Department of ENT, Maulana Azad Medical College, New Delhi
- Dr. Ravi Kumar, Professor & Head, Department of ENT, Sri Ramachandra Medical College & Research Institute, Chennai
- Dr. Suma Mathew, Professor, Department of ENT, Christian Medical College, Vellore, Tamil Nadu

17. Obstetrics and Gynaecology

- Dr. Neerja Bhatla, Professor, Department of Obstetrics & Gynecology, All India Institute of Medical Sciences, New Delhi
- Dr. Annie Regi, Professor & Head, Department of Obstetrics & Gynecology, Christian Medical College, Vellore, Tamil Nadu
- Dr. Usha Vishwanath, Professor, Department of Obstetrics & Gynecology, Sri Ramachandra Medical College & Research Institute, Chennai

18. Orthopaedics

- Dr. P.V. Vijayaraghavan, Vice Chancellor & Professor of Orthopedics, Sri Ramachandra Medical College & Research Institute, Chennai
- Dr. Raj Bahadur, Professor & Head, Department of Orthopaedics, Postgraduate Institute of Medical Sciences, Chandigarh
- Dr. SC. Goel, Professor, Department of Orthopaedics, Institute of Medical Sciences, BHU, Varanasi, Uttar Pradesh

19. Anaesthesiology

- Dr. Baljit Singh, Director Professor of Anaesthesia, G. B. Pant Hospital, Delhi
- Dr. Ramesh Keshav, Department of Anaesthesia, Dr. Ram Manohar Lohia Hospital, New Delhi
- Dr. Mridula Pawar, Consultant & Head, Department of Anaesthesia, Vardhman Mahavir Medical College & Safdarjung Hospital, New Delhi

20. Radio- Diagnosis

- Dr. Kishor Taori (late), Professor & Head, Department of Radiodiagnosis, Government Medical College, Nagpur

21. Radiotherapy

- Dr. P. K. Jhulka, Dean & Professor of Radiotherapy, All India Institute of Medical Sciences, New Delhi.
- Dr. Shyam Shrivastava, Head, Department of Radiation, Tata Memorial Hospital, Mumbai

22. Dentistry

- Dr. Sridevi Padmanabhan, Professor, Department of Orthodontics, Faculty of Dental Sciences, Sri Ramchandra Medical College & Research Institute, Chennai

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राष्ट्रीय आयुर्विज्ञान आयोग

(स्नातक चिकित्सा शिक्षा बोर्ड, 2023)

अधिसूचना

नई दिल्ली, 2 जून, 2023

सं. यू 14021—8—2023—यूजीएमईबी.—**जबकि** सामान्य रूप से चिकित्सा शिक्षा और विशेष रूप से राष्ट्रीय आयुर्विज्ञान आयोग अधिनियम, धारा 24 की उप-धारा (1) और उक्त अधिनियम की धारा 57 की उपधारा (2) के उप खंड (ज), (झ), (ञ), (ट),(ण), (त), (त), (थ), (द), (ध) की तुलना में राष्ट्रीय आयुर्विज्ञान आयोग अधिनियम, 2019 द्वारा प्रदत्त समस्त शक्तियों का प्रयोग करते हुए, राष्ट्रीय आयुर्विज्ञान आयोग निम्नलिखित विनियम बनाता है:

1. (i) ये विनियम "स्नातक चिकित्सा शिक्षा विनियम, 2023" या इसके संक्षिप्त रूप में "जीएमईआर-23" हैं।

(ii) ये सभी विनियम राजपत्र में अधिसूचना के माध्यम से विधिवत प्रकाशन के तुरंत बाद प्रवृत्त होंगे।

जबकि स्नातक चिकित्सा शिक्षा के फोकस को समुदाय द्वारा निम्नलिखित रूप में मान्यता दी गई है; स्नातक चिकित्सा विद्वान निम्नलिखित में सक्षम होंगे –

1. अधिकतम संभव सीमा तक सभी के लिए स्वास्थ्य सुनिश्चित करने के लिए प्राप्त ज्ञान और कौशल का प्रयोग करना।

2. सामान्य बीमारियों के प्रोत्साहक, निवारक, उपचारात्मक और पुनर्वास पहलुओं को शामिल करते हुए चिकित्सा की समग्र प्रैक्टिस में दक्षता हासिल करना।

3. वैज्ञानिक सोच विकसित करना, पेशे में प्रवीणता के लिए शिक्षा का अनुभव प्राप्त करना और स्वस्थ जीवन को बढ़ावा देना।

4. स्वास्थ्य को प्रभावित करने वाले सामाजिक-मनोवैज्ञानिक, सांस्कृतिक, आर्थिक और पर्यावरणीय कारकों को समझना और अपनी व्यावसायिक जिम्मेदारियों के निर्वहन करने में रोगियों के प्रति मानवीय दृष्टिकोण विकसित करना।

5. निरंतर स्वयं सीखने के लिए] आगे की विशेषज्ञता प्राप्त करने **और** चिकित्सा, अनुसंधान और दस्तावेजी कौशल के किसी भी चुने हुए क्षेत्र में अनुसंधान करने की अभिरुचि रखना।

6. स्वास्थ्य देखभाल प्रदायगी, सामान्य अस्पताल प्रबंधन, प्रमुख सूची कौशल और परामर्श से संबंधित मानव संसाधन, सामग्री और संसाधन प्रबंधन में बुनियादी प्रबंधन कौशल प्राप्त करना।

7. स्वास्थ्य परिचर्या समूहों में एक प्रमुख भागीदार के रूप में काम करने और संचार कौशल में दक्षता हासिल करने में सक्षम होना ।

8. पेशेवर जीवन के लिए आवश्यक व्यक्तिगत विशेषताओं और अभिरुचि को विकसित करना जैसे कि व्यक्तिगत सत्यनिष्ठा, जिम्मेदारी की भावना और निर्भरता और अन्य व्यक्तियों से या उनकी चिंताओं से संबद्ध होना ।

9. पेशेवर नैतिकता के उच्चतम मानकों का पालन करते हुए और राष्ट्रीय आकांक्षाओं को पूरा करने के लिए सामाजिक और पेशेवर दायित्वों को पूरा करने की दिशा में काम करके एक अनुकरणीय नागरिक बनना।

10. चिकित्सा शिक्षा के विकास का उद्देश्य इसे अपेक्षाकृत अधिक शिक्षार्थी-केंद्रित (शैक्षणिक के बजाय), रोगी-केंद्रित, लैंगिक संवेदनशीलता, परिणाम-उन्मुख और पर्यावरण के अनुकूल बनाना है। इसके परिणामस्वरूप एक परिणाम-आधारित पाठ्यक्रम है जो वैश्विक रुझानों के अनुरूप हो। विषय-आधारित निर्देश और मूल्यांकन की क्षमता और आवश्यकता का सम्मान करते हुए क्षैतिज और ऊर्ध्वाधर दोनों तरह के विषयों के संरेखण और एकीकरण पर जोर दिया जाता है। इससे व्यापक सक्षमता के उपयोग की अपेक्षा इंड ऑफ़ फ़ेज विषयक सक्षमता को अपनाने की आवश्यकता महसूस हुई है।

11. अभिरुचि, नैतिकता और संवाद (एईटीसीओएम) सक्षमता के आधार पर अनुदैर्ध्य कार्यक्रम के रूप में समर्पित पाठ्यक्रम समय प्रदान करके नैतिक मूल्यों की महत्ता, रोगी की जरूरतों के प्रति संवेदनशीलता और संवाद कौशल प्राप्त करने को रेखांकित किया गया है। इसमें सहयोगी और अंतर-विषयक टीमवर्क, व्यावसायिकता, परोपकारिता और विचार, सामाजिक और आर्थिक स्थिति और लिंग संबंधी अंतर के प्रति उचित संवेदनशीलता के साथ व्यावसायिक संबंधों में सम्मान पर जोर दिया गया है।

3. जबकि स्नातक चिकित्सा शिक्षा प्रदान करने वाले संस्थान उच्चतर ज्ञान, उपयुक्त कौशल और आवश्यक त्रुटिहीन नैतिक मानकों के साथ प्रशिक्षित जनशक्ति तैयार करने के लिए राष्ट्रीय लक्ष्यों के साथ संस्थागत लक्ष्यों का तालमेल करने के लिए लगातार काम करेंगे।

अध्याय I – प्रारंभिक

1. **संक्षिप्त शीर्षक** - ये विनियम "स्नातक चिकित्सा शिक्षा विनियम, 2023" या इसके संक्षिप्त रूप में "जीएमईआर - 23" हैं।

प्रारंभ –ये सभी विनियम राजपत्र में अधिसूचना के माध्यम से विधिवत प्रकाशन के तुरंत बाद प्रवृत्त होंगे।

2. **परिभाषाएँ** - इन विनियमों में, जब तक कि संदर्भ में अन्यथा अपेक्षित न हो, यहाँ परिभाषित शब्दों का वही अर्थ होगा जो नीचे दिया गया है और उनके सजातीय पद और भिन्नताओं का अर्थ तदनुसार लगाया जाएगा -

क "अधिनियम" से राष्ट्रीय आयुर्विज्ञान आयोग अधिनियम, 2019 [2019 की अधिनियम संख्या 30] अभिप्रेत होगा।

ख यूजीएमईबी से अधिनियम की धारा 16 के तहत विधिवत गठित स्नातक चिकित्सा शिक्षा बोर्ड अभिप्रेत होगा।

ग "आयोग" से अधिनियम की धारा 3 के तहत विधिवत स्थापित राष्ट्रीय आयुर्विज्ञान आयोग अभिप्रेत होगा।

घ "चिकित्सा संस्थान" से वह *'चिकित्सा संस्थान' अभिप्रेत होगा* जिसे राष्ट्रीय आयुर्विज्ञान आयोग अधिनियम, 2019 की धारा 2 (i) में परिभाषित किया गया है; और इसके सामान्य रूप से समझे जाने वाले रूप में 'मेडिकल कॉलेज' भी शामिल होगा।

ड- "एनईईटी-यूजी" से राष्ट्रीय आयुर्विज्ञान आयोग अधिनियम, 2019 की धारा 14 में *'राष्ट्रीय पात्रता-सह-प्रवेश परीक्षा'अभिप्रेत होगा।*

च- "विश्वविद्यालय" से राष्ट्रीय आयुर्विज्ञान आयोग अधिनियम, 2019 की धारा 2 की उप-धारा (च) और (भ) में यथा परिभाषित विश्वविद्यालय अभिप्रेत होगा।

अध्याय II - सामान्य विचार

4. सभी संबंधित **चिकित्सा संस्थानों /मानद** विश्वविद्यालयों का यह कर्तव्य होगा कि वे निम्नलिखित हेतु राष्ट्रीय आयुर्विज्ञान आयोग के साथ भागीदारी करें –

क. छात्र को सक्षम मेडिसिन और सर्जरी स्नातक बनाने के लिए उच्च गुणवत्ता वाली और सस्ती स्नातक चिकित्सा शिक्षा प्रदान करने के लिए समुचित पाठ्यक्रम लागू करना।

ख- योग्यता-आधारित चिकित्सा शिक्षा सुनिश्चित करने के लिए सैद्धांतिक ज्ञान के साथ नैदानिक और व्यावहारिक कौशल में प्रशिक्षण प्रदान करने, अभिरुचि, नैतिकता और संवाद कौशल पर जोर देना।

ग. छात्रों को स्व-निर्देशित शिक्षा के प्रति प्रोत्साहित करना, जो भारत में स्वास्थ्य परिचर्या की स्वदेशी प्रणालियों के ज्ञान सहित मानव स्वास्थ्य का पर्याप्त बुनियादी ज्ञान प्रदान करेंगे; छात्रों के बीच सद्भाव, और शांति विकसित करने, तनाव को दूर करने और अवसाद को कम करने के लिए उनके प्रशिक्षण के दौरान योग और आध्यात्मिक पहलुओं को कार्यान्वित किया जाता है।

घ. छात्रों को विषयों और अपनी पसंद के क्षेत्रों में कौशल प्रशिक्षण लेने के लिए प्रोत्साहित करें, जो उनकी तार्किक और वैज्ञानिक सोच, और सामुदायिक स्तर और व्यक्तिगत स्तरों पर समस्या-समाधान को प्रोत्साहित करेगा।

ड. छात्रों को प्रशिक्षण और पेशे में उच्चतम नैतिक मानकों को प्राप्त करने और बनाए रखने के लिए प्रोत्साहित करना।

च. उच्चतम वैश्विक मानकों को पूरा करने के लिए देश भर में चिकित्सा संस्थाओं द्वारा प्रदान की जा रही चिकित्सा शिक्षा का आवधिक और पारदर्शी मूल्यांकन प्रदान करना।

छ. सभी स्तरों पर आपात स्थिति और आपदाओं से निपटने के लिए छात्रों में आत्मविश्वास पैदा करना।

5. उपर्युक्त के प्रति पूर्वाग्रह के बिना, संबंधित विश्वविद्यालय और उनके अधीन चिकित्सा संस्थान, यह सुनिश्चित करेंगे कि कार्य के उचित रिकॉर्ड रखें जाए ताकि वे छात्रों के उद्देश्यपूर्ण, कुशल और पारदर्शी आंतरिक मूल्यांकन का आधार बन सकें। बशर्ते कि, इन अनुरक्षित और अच्छी तरह से वर्गीकृत दस्तावेजों को विशेष रूप से संबंधित विश्वविद्यालय या एनएमसी द्वारा मेडिकल कॉलेज के मूल्यांकन के प्रयोजनों के लिए हर समय परामर्श के लिए उपलब्ध कराया जाएगा।

6. संबंधित विश्वविद्यालय और उनके अधीन चिकित्सा संस्थानों का यह सतत प्रयास रहेगा कि छात्रों को शिक्षित करते हुए छात्रों, संकाय और चिकित्सा शिक्षा विभाग द्वारा विकसित प्रौद्योगिकी के इष्टतम उपयोग के लिए लगातार रणनीतियों को विकसित किया जाए।

अध्याय III - प्रवेश, परामर्श, प्रवास आदि।

7- नीट-यूजी का संचालन - राष्ट्रीय आयुर्विज्ञान आयोग नीट-यूजी आयोजित कर सकता है अथवा नीट-यूजी आयोजित करने के लिए ऐसी किसी भी एजेंसी या प्राधिकरण जो भी इसका नाम हो, नामित कर सकता है।

बशर्ते राष्ट्रीय आयुर्विज्ञान आयोग नीट-यूजी आयोजित करने के लिए कई एजेंसियों या प्राधिकरणों को नामित कर सकता है, यदि इस तरह की तैनाती समग्र उद्देश्य के अनुरूप हो।

8. अंडर ग्रेजुएट मेडिकल एजुकेशन बोर्ड अधिसूचना के माध्यम से नीट-यूजी आयोजित करने की भाषा,तरीके और तौर-तरीकों आदि का निर्धारण करेगा।

बशर्ते कि, अंडर ग्रेजुएट मेडिकल एजुकेशन बोर्ड नीट-यूजी के संचालन के संबंध में अपनी नीतियों को बदलने का निर्णय लेने पर उचित समय सीमा के साथ सूचित करेगा ताकि इच्छुक छात्रों को नुकसान न हो।

9.पात्रता मानदंड - कोई भी छात्र नीट-यूजी परीक्षा में न्यूनतम पात्र अंक प्राप्त करने के अलावा, भारत में या कहीं और स्नातक चिकित्सा शिक्षा प्राप्त करने के लिए पात्र नहीं होगा (यदि वे भारत में लौटना और प्रैक्टिस करना चाहते हैं)।

बशर्ते स्नातक चिकित्सा शिक्षा बोर्ड अधिसूचना द्वारा समय-समय पर पात्र छात्रों की सूची की घोषणा करेगा।

10.नीट–यूजी में समान अंकों का विभाजन– नीट–यूजी के लिए उपस्थित होने वाले छात्रों के समान अंकों के मामले में, नीट यूजी में भौतिकी के बाद रसायन विज्ञान ओर उसके बाद जीव विज्ञान में प्राप्त संबंधित अंकों पर विचार किया जाएगा।

बशर्ते यदि अंक बराबर रखें जाने है तो किसी मानव हस्तक्षेप के बिना कम्प्यूटर से लाट्स का ड्रा निकालकर पात्र उम्मीद्वारों का चयन किया जाएगा।

11. **नीट-यूजी करने हेतु पात्रता मानदंड** आकांक्षी को नीट-यूजी करने की अनुमति देने हेतु पात्रता मानदंड ।

क. जब तक कि नीट-यूजी परीक्षा देने के लिए अभ्यर्थी ने उस वर्ष 31 जनवरी को या उससे पहले 17 वर्ष की आयु पूरी न कर ली हो; और

ख. उसने भौतिक विज्ञान, रसायन विज्ञान, जीव विज्ञान/जैव प्रौद्योगिकी और अंग्रेजी विषयों के साथ 10+2 (अथवा इसके समकक्ष) उत्तीर्ण कर लिया हो।

12. कॉमन काउंसिलिंग– वर्तमान विनियमों अथवा एनएमसी विनियमों में दी गई किसी भी बात पर प्रतिकूल प्रभाव डाले बिना नीट-यूजी की मेरिट सूची के आधार पर भारत में सभी चिकित्सा संस्थाओं में मेडिसिन में स्नातक पाठ्यक्रम में प्रवेश लेने के लिए कॉमन काउंसिलिंग होगी।

13. यह परामर्श पूर्णरूप से राष्ट्रीय आयुर्विज्ञान आयोग द्वारा उपलब्ध कराए गए सीट मैट्रिक्स पर आधारित होगा;

बशर्ते कॉमन काउंसिलिंग के आवश्यकतानुसार अनेक दौर हो सकते हैं

14. कॉमन काउंसिलिंग का आयोजन:- कॉमन काउंसिलिंग का आयोजन करने के लिए अंडर ग्रेजुएट मेडिकल एजुकेशन बोर्ड दिशानिर्देश प्रकाशित करेगा और निम्नलिखित धारा 17 के अंतर्गत नामित प्राधिकरण इस प्रकार प्रकाशित दिशा निर्देशों के अनुरूप कॉमन काउंसिलिंग का आयोजन करेगा।

15. सरकार कॉमन काउंसिलिंग के लिए किसी नामित प्राधिकरण को नियुक्त करेगी–भारत सरकार प्राधिकरण के बारे में निर्णय करेगी और सभी अन्तरस्नात्तक सीटों के लिए काउंसलिंग के तरीकों को अधिसूचित करेगी।

16. काउंसिलिंग के अलावा किसी अंन्य तरीके से प्रवेश लेने पर प्रतिषेध–

कोई भी चिकित्सा संस्थान इन विनियमों के उल्लंघन में किसी भी उम्मीदवार को स्नातक चिकित्सा शिक्षा पाठ्यक्रम में प्रवेश नहीं देगा।

बशर्ते कि इन विनियमों के उल्लंघन में किसी छात्र को प्रवेश देने वाले चिकित्सा संस्थान को पहली बार प्रति सीट एक करोड़ रुपए या पूरे पाठ्यक्रम के दौरान लिए जाने वाले शुल्क, जो भी अधिक हो, जुर्माने के रूप में भरना होगा और दूसरी बार अनुपालन नहीं करने पर प्रति सीट दो करोड़ रुपए या पूरे पाठ्यक्रम के दौरान लिए जाने वाले शुल्क की दोगुनी राशि, जो भी अधिक हो, जुर्माने के तौर पर भरना होगा और उसके बाद अनुपालन नहीं किए जाने या बार–बार उल्लंघन करने वाले चिकित्सा संस्थान को अगले शक्षणिक वर्ष से किसी भी छात्र को प्रवेश देने से वंचित कर दिया जाएगा;

आगे यह भी उपबंधित किया गया है कि इस अधिदेश के उल्लंघन में प्रवेश पाने वाले छात्र को मेडिकल कॉलेज से निकाल दिया जाएगा और एक या अधिक वर्षों के लिए ऐसी सीटों की दोगुनी संख्या में सीटे घटा दी जाएंगी।

17. अंतिम सूची प्रस्तुत करना– संबंधित नामित प्राधिकारी (जिन्होंनें कॉमन काउंसिलिंग आयोजित की है) सामान्य काउंसिलिंग के पूरा होने के एक सप्ताह के भीतर निर्धारित प्रारूप में छात्रों की अंतिम सूची स्नात्तक चिकित्सा शिक्षा बोर्ड को प्रस्तुत करेंगे, जो एनएमसी वेबसाईट पर उस सूची को प्रकाशित अपलोड कराएगा।

बशर्ते प्रत्येक संस्थान एमएसआर में विस्तृत निर्धारित प्रपत्र छात्रों की अंतिम सूची यूजीएमईबी द्वारा घोषित पाठ्यक्रम शुरू होने की अंतिम तिथि से एक सप्ताह पहले यूजीएमईबी को प्रस्तुत करेगा।

बशर्ते केवल वही चिकित्सा संस्थान जिन्हें छात्रों को कॉमन काउंसिलिंग की अधिसूचना की तिथि से पूर्व प्रवेश देने की अनुमति दी गई थी, छात्रों को प्रवेश लेने की अनुमति देंगे और चिकित्सा संस्थान जिन्हें कॉमन काउंसिलिंग की अधिसूचना की तिथि के बाद आवश्यक अनुमति मिली हो, को अगले शक्षणिक वर्ष में छात्रों को प्रवेश देने हेतु कॉमन काउंसिलिंग में भाग लेना होगा।

स्पष्टीकरणः पहले से स्थापित चिकित्सा संस्थानों की सीटों की संख्या में वृद्धि के लिए भी अपेक्षित अनुमति यथोचित परिवर्तनों सहित लागू होगी ।

18. छात्र प्रवासन– इन विनियमों में कुछ भी बताए जाने के बावजूद, किसी चिकित्सा संस्थान के लिए नामित कोई भी छात्र किसी अन्य चिकित्सा संस्थान में प्रवास की मांग नहीं करेगा।

अध्याय iv–चिकित्सा शिक्षा के लिए अपेक्षाओं के न्यूनतम मानक(एमएसआर)

19. चिकित्सा संस्थान समय–समय पर एनएमसी के यूजीएमईबी द्वारा स्नात्तक चिकित्सा शिक्षा के लिए निर्धारित आवश्यकताओं के न्यूनतम मानकों (एमएसआर) संबंधी दिशा–निर्देशों का पालन करेंगे।

अध्याय v: स्नात्तक स्तर पर योग्यता आधारित गतिशील पाठ्यक्रम

20. पाठ्यक्रम– स्नात्तक चिकित्सा शिक्षा बोर्ड समय–समय पर एनएमसी की वेबसाईट पर मॉडल पाठ्यक्रम और उसके परिणामी उद्धेश्यों को प्रकाशित करेगा, जो संबंधित विश्वविद्यालयों द्वारा सार्थक शिक्षा प्रदान करने के लिए उपयुक्त कार्यप्रणाली के साथ विस्तृत चिकित्सा पाठ्यक्रम के विकास के लिए आधार तैयार करेगा।

अपेक्षाओं का विवरण निर्धारित मानकों के अनुरूप होगा। ये मानक बदलते स्वास्थ्य परिदृश्य के साथ समय–समय पर संशोधन के विषयाधीन है।

21. प्रशिक्षण काल और अधिकतम अवधि– इन विनियमों के अनुसार प्रवेश लेने वाले प्रत्येक छात्र, एनएमसी के यूजीएमईबी के द्वारा प्रकाशित और समय–समय पर एमनएमसी वेबसाईट पर प्रदर्शित दिशा–निर्देशों के अनुसार प्रशिक्षण प्राप्त करेगा।

बशर्ते किसी भी में परिस्थिति में छात्र को प्रथम वर्ष (प्रथम व्यवसायिक एमबीबीएस) के लिए चार से अधिक प्रयासों की अनुमति नहीं दी जाएगी और किसी भी छात्र को पाठ्क्रम में प्रवेश की तारीख से नौ(09) वर्षों के बाद स्नात्तक चिकित्सा पाठ्यक्रम जारी रखने की अनुमति नहीं दी जाएगी।

22. विकल्प–आधारित केडिट पाठ्यक्रम – चिकित्सा संस्थानों द्वारा पढ़ाए जाने वाले एनएमसी पाठ्यक्रम और उनके संबंधित विश्वविद्यालय द्वारा निर्धारित पाठ्यक्रम के अलावा चिकित्सा स्नात्तक पाठ्यक्रम को बाधित किए बिना सीमित अवधि के विभिन्न प्रकार के विकल्प– आधारित केडिट पाठ्यक्रम भी होंगे।

बशर्ते इन विकल्प–आधारित केडिट पाठ्यक्रमों के सार्थक शिक्षण को एनएमसी के चिकित्सा मूल्यांकन और रेटिंग बोर्ड द्वारा चिकित्सा संस्थानों की मान्यता और रेटिंग के दौरान उचित महत्व दिया जाएगा।

23. इंटर्नशिप – स्नातक चिकित्सा शिक्षा कार्यक्रम में प्रवेशप्राप्त छात्र की तब तक स्नातक स्तर की पढ़ाई पूरी नहीं होगी जब तक कि वह अनिवार्य रोटेटिंग मेडिकल इंटर्नशिप विनियम, 2021 के अनुसार अपनी रोटेटिंग मेडिकल इंटर्नशिप पूरी नहीं कर लेता है।

अध्याय VI - संकाय विकास कार्यक्रम

24. नए पाठ्यक्रम में प्रशिक्षण के लिए शिक्षण संकाय द्वारा छात्रों को पढ़ाने में समूह गतिशीलता, टीम निर्माण अभ्यास और छोटे समूह में शिक्षण की अवधारणाओं को समझने और लागू करने, छात्रों को स्व-निर्देशित शिक्षण के लिए प्रोत्साहित करने और प्राथमिक स्वास्थ्य परिचर्या स्तर पर टीम लीडर बनने हेतु कौशल वृद्धि अपेक्षित है। ये प्रशिक्षण कौशल समय-समय पर अधिसूचित किए जाने वाले दिशा-निर्देशों में वर्णित विभिन्न कार्यक्रमों के माध्यम से प्रदान किए जाएंगे।

अध्याय VII-छात्र कल्याण

25. शिक्षण के अच्छे माहौल के लिए छात्र-कल्याण सबसे अधिक आवश्यक है। रैगिंग से जुड़ी समस्याएं छात्रों के कल्याण में बाधक होती हैं। इसलिए, छात्रों से आशा की जाती है कि वे मेडिकल कॉलेजों और संस्थानों में रैगिंग की रोकथाम और प्रतिषेध विनियम, 2021 का पालन करें।

बशर्ते कि मेडिकल कॉलेज/संस्थान में छात्रों के कल्याण को प्रभावी बनाने के लिए यहां एक निर्वाचित छात्र-संघ हो तथा मेडिकल कॉलेज/संस्थान द्वारा निर्णय लेने की प्रक्रिया में छात्रों का प्रतिनिधित्व हो।

डॉ. पुलकेश कुमार, सचिव

[विज्ञापन-III/4/असा./148/2023-24]

टिप्पणी : ये विनियम अंग्रेजी और हिन्दी में प्रकाशित किए जा रहे हैं, इन विनियमों की व्याख्या के मामले में कोई शंका होने की स्थिति में अंग्रेजी संस्करण मान्य होगा ।

NATIONAL MEDICAL COMMISSION

(Under Graduate Medical Education Board, 2023)

NOTIFICATION

New Delhi the 2nd June, 2023

No U-14021-8-2023-UGMEB.—In exercise of overall powers conferred by the National Medical Commission Act, 2019 *vis-à-vis* medical education in general and specifically by sub-section (1) of section 24; and sub-section (h), (i), (j), (k), (o), (p), (p), (q), (r), (s) of sub-section (2) of section 57 of the said Act, the National Medical Commission makes the following Regulations –

1. (i). These Regulations may be called the "Graduate Medical Education Regulations, 2023" or "GMER-23" in its abbreviated form.

(ii). These Regulations shall come into force from the date of their publication in the official Gazette.

2. **WHEREAS** the focus of undergraduate medical education is recognized by the fraternity as; the Graduating medical scholar shall be able to –

1) Apply the gained knowledge and skill to ensure health for all to the maximum extent possible.

2) Achieve competence in the holistic practice of medicine encompassing promotive, preventive, curative and rehabilitative aspects of common diseases.

3) Develop a scientific temper, acquire education experience for proficiency in the profession and promote healthy living.

4) Appreciate the socio-psychological, cultural, economic, and environmental factors affecting health and develop a humane attitude towards the patients in discharging one's professional responsibilities.

5) Possess the attitude for continued self-learning to seek further expertise and to pursue research in any chosen area of medicine, research, and documental skills.

6) Acquire basic management skills in human resources, materials and resource management related to health care delivery, general hospital management, principal inventory skills and counselling.

7) Able to work as a leading partner in healthcare teams and acquire proficiency in communication skills.

8) Develop personal characteristics and attitudes required for professional life such as personal integrity, sense of responsibility and dependability and ability to relate to or show concern for other individuals.

9) Become an exemplary citizen by observing the highest standards of professional ethics and working towards fulfilling social and professional obligations to respond to national aspirations.

10) Evolution of medical education is aimed at making it more learner-centric (rather than pedagogic), patient-centric, gender-sensitive, outcome -oriented and environment appropriate. The result is an outcome-driven curriculum which conforms to global trends. Emphasis is made on the alignment and integration of subjects both horizontally and vertically while respecting the strengths and necessity of subject-based instruction and assessment. This has necessitated a deviation from using "broad competencies" to end-of-phase subject (sub) competencies.

11) The importance of ethical values, responsiveness to the needs of the patient and acquisition of communication skills is underscored by providing dedicated curriculum time in the form of a longitudinal program based on Attitude, Ethics and Communication (AETCOM) competencies. Emphasis has been placed on collaborative and inter-disciplinary team work, professionalism, altruism and respect in professional relationships with due sensitivity to differences in thought, social and economic position and gender.

3. **WHEREAS** the Institutions imparting graduate medical education shall continually work to synchronize the institutional goals with the national goals to produce the kind of trained manpower with higher knowledge, appropriate skills and impeccable ethical standards required.

CHAPTER I – PRELIMINARY

1. **Short title–**These Regulations may be called the "Graduate Medical Education Regulations, 2023" or "GMER-23" in its abbreviated form.

Commencement – These Regulations shall come into force from the date of their publication in the official Gazette.

2. **Definitions** – In these Regulations, unless the context otherwise requires the terms defined herein shall bear the meaning assigned to them below and their cognate expressions and variations shall be construed accordingly –

a. **"Act"** shall mean National Medical Commission Act, 2019 [Act No. 30 of 2019].

b. **"UGMEB"** shall mean Undergraduate Medical Education Board, duly constituted under Section 16 of the Act.

c. **"Commission**" shall mean the National Medical Commission duly established under Section 3 of the Act.

d. **"Medical Institution"** shall mean *'Medical Institution'* as defined in Section 2(i) of the National Medical Commission Act, 2019; and shall also include a 'medical college' in its commonly understood form.

e. **"NEET-UG"** shall mean *'National Eligibility-cum-Entrance Test'* in Section 14 of the National Medical Commission Act, 2019

f. **"University"** shall mean the University as defined under sub-section (f) and (x) of Section 2 of the National Medical Commission Act, 2019.

CHAPTER II – GENERAL CONSIDERATIONS

3. It shall be the duty of all concerned medical institutions/ Deemed to be Universities to partner with the National Medical Commission to –

a. Implement an appropriate curriculum to provide high-quality and affordable undergraduate medical education to the student to make him a complete Bachelor of Medicine and Surgery, and a competent Physician of the first contact.

b. To provide training in clinical and practical skills along with theoretical knowledge, an emphasis upon attitude, ethics, and communication skills to ensure imparting competency-based medical education.

c. Encourage students towards self-directed learning, which will impart an adequate basic knowledge of human health, including the knowledge from indigenous systems of healthcare in India; Yoga and healthy living aspects are introduced during their training to develop harmony, and peace, relieve stress and alleviate depression amongst students.

d. Encourage students to take up skill training in the subjects and areas of their choice, which shall stimulate their logical and scientific thinking, and problem-solving at the community level and individual levels.

e. Encourage the students to achieve and maintain the highest ethical standards in training and profession.

f. Provide periodic and transparent assessment of medical education being imparted by Medical Institutions across the nation to meet with highest global standards.

g. Inspire confidence in the students to handle emergencies and calamities at all levels.

4. Without prejudice to the above, the concerned medical institutions/ Deemed to be Universities shall ensure that proper records of the work shall be maintained so that they form the basis of objective, efficient and transparent internal assessment of students;

Provided further that, these maintained and well-classified documents shall be made available for consultation at all times, particularly for the purposes of assessment of the Medical College either by the concerned University or NMC.

6. The concerned University shall encourage the Medical Colleges to offer optimal number and variety of choice-based credit courses which shall traction the medical education in producing the outcomes of a medical graduate, as identified by these Regulations.

CHAPTER III –ADMISSION, COUNSELLING, MIGRATION ETC.

7. Conduct of NEET-UG – Either the National Medical Commission may conduct the NEET-UG or may designate any such agency or authority by whatever name called, to cause the NEET-UG to be conducted;

Provided National Medical Commission may designate multiple agencies or authorities, to conduct NEET-UG if such deployment suits the overall purpose.

8. The UGMEB shall determine the language, manner and modalities etc., of conducting the NEET-UG by way of Notification;

Provided that, the UGMEB shall notify with reasonable lead time when it decides to change its policies with regard to the conduct of NEET-UG so that aspiring students are not put to detriment.

9. Eligibility criteria –No student shall be eligible to pursue graduate medical education either in India or elsewhere (if they want to return and practice in India), except by scoring the minimum eligible score at the NEET-UG exam;

Provided the UGMEB shall by notification announce the list of eligible students from time to time.

10. Break of tie-in marks at NEET-UG– In case of tie-in marks of the students appearing for NEET-UG, the respective marks obtained in Physics followed by Chemistry and further followed by Biology in the NEET-UG shall be considered;

Provided if the tie were to continue, then draw of lots by using the computer, with no human intervention, the eligible candidates shall be selected.

11. Eligibility criteria for taking NEET-UG–No aspirant shall be allowed to take NEET-UG

a. unless he has completed the age of 17 years as on or before 31st January of the year that the candidate shall be appearing for NEET- UG examination; and

b. Has passed 10 +2 (or equivalent) with subjects of Physics, Chemistry Biology/ Biotechnology and English.

12. Common counselling – Without prejudice to anything stated in the present Regulations or other NMC Regulations, there shall be common counselling for admission to graduate courses in medicine for all Medical Institutions in India based on the merit list of the NEET-UG.

13. Counselling shall entirely be based on the seat matrix provided by National Medical Commission; Provided the common counseling may have multiple rounds as may be necessary.

14. Conduct of common counselling – the UGMEB shall publish guidelines for the conduct of common counselling, and the designated authority under section 17 below shall conduct the common counselling in conformity with such published guidelines.

15. Government to appoint a designated authority for common counselling – The Government of India will decide and notify the agency and method of counseling of all undergraduate seats.

16. The prohibition for any student seeking admission any other way than counselling – No medical institute shall admit any candidate to the Graduate Medical Education course in contravention of these regulations;

Provided the Medical Institution granting admission to any student in contravention of these Regulations, shall be liable to be fined Rupees one crore or fee for the entire course duration, whichever is higher, per seat for the first time and for the second time of non-compliance, Rupees two crore or double the amount of fees for the entire course duration whichever is higher per seat, and for any subsequent non-compliance or continued contravention the Medical Institution shall be barred from granting admissions to any student from the next academic year;

Provided further that such Student admitted in contravention of this mandate shall be discharged from the Medical College and double the number of seats shall be reduced for one or more years.

17. Submission of the final list – The respective designated authorities (who have conducted the common counselling) shall submit the final list of students in the prescribed proforma to the UGMEB within one (01) week of the completion of the common counselling, which in turn shall publish that list in the NMC website.

Provided each institution shall also submit the final list of students admitted, in the prescribed proforma as detailed in the MSR, to the UGMEB within one week of the last date of the joining course, declared by the UGMEB;

Provided only those Medical Institutions that were permitted to admit the students prior to the date of Notification of common counselling are allowed to admit students, and the Medical Institutions getting requisite permission later to the date of Notification of common counselling shall participate in the next academic year's common counselling to admit students.

Explanation: requisite permission shall also apply *mutatis mutandis* for the increase of seat strength in medical institutions already established.

18. Student migration -No student designated to a Medical Institution, notwithstanding anything stating in these regulations, shall seek migration to any other Medical Institution.

CHAPTER IV –MINIMUM STANDARDS OF REQUIREMENTS (MSR) FOR MEDICAL EDUCATION

19. Medical Institutions shall follow the guidelines for minimum standards of requirements (MSR) for undergraduate medical education prescribed by the UGMEB of NMC from time to time.

CHAPTER V: COMPETENCY BASED DYNAMIC CURRICULUM AT UNDERGRADUATE LEVEL

20. Curriculum – the UGMEB shall publish the model curriculum and the outcome objectives of the same from time to time on the NMC website, which shall form the base for the development of a detailed medical curriculum by the concerned Universities, along with the appropriate methodology to impart meaningful education.

The details of the requirements shall conform to the prescribed standards. These standards are subject to modification from time to time with the changing healthcare scenario.

21. Training period and maximum duration– Every student admitted in accordance with these Regulations, shall undergo training as per the guidelines published by the UGMEB of NMC and displayed on the NMC website from time to time;

Provided under no circumstances the student shall be allowed more than four (04) attempts for first year (First Professional MBBS) and no student shall be allowed to continue undergraduate medical course after nine (09) years from the date of admission into the course.

22. Choice-based credit courses – There shall be a variety of choice-based credit courses of limited duration offered by the Medical Institutions in addition to the NMC curriculum and the curriculum prescribed by their respective University to their graduating students without hampering the medical graduate curriculum;

Provided the meaningful imparting of these choice-based credit courses shall be given due weightage, while accreditation and rating of the Medical Institutions by the Medical Assessment and Rating Board of NMC.

23. Internship – The student admitted into a Graduate Medical Education Programme shall not be deemed to have completed his graduation until he completes his rotating medical internship as per Compulsory Rotating Medical Internship Regulations, 2021.

CHAPTER VI – FACULTY DEVELOPMENT PROGRAM

24. The new curriculum training requires the teaching faculty to understand and apply the concepts of group dynamics in teaching students, team building exercises, and small group teachings, encourage the students towards self-directed learning and enhance their skills to become team leaders at the primary health care level. These training skills shall be imparted through various programmes as described in the guidelines to be notified from time to time.

CHAPTER VII–STUDENT WELFARE

25. The student welfare is central to good learning atmosphere. The issues related to ragging disrupt student's well-being. Hence, students are expected to abide by Prevention and Prohibition of Ragging in Medical Colleges and Institutions Regulations, 2021;

Provided that there shall be an elected student association and representation of students in decision making by the Medical College/ Institution affecting student welfare.

Dr. PULKESH KUMAR, Secy.

[ADVT.-III/4/Exty./148/2023-24]

Note : These Regulations are being published in English and Hindi, the English version shall prevail in case of any doubt about the interpretation of these Regulations.

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Medical Council of India

A E T C O M

ATTITUDE, ETHICS & COMMUNICATION

Communication

Reliability

Patient centered

Professionalism

Personal growth

Leadership

Respect

Teamwork

Accountability

Responsiveness

Lifelong learning

Attitude

System based learning

Responsibility

Social Commitment

Values

Knowledge	Skills	Attitudes	Values	Responsiveness	Communication

2018

Attitude, Ethics and Communication

(AETCOM)

Competencies for the

Indian Medical Graduate

2018

Medical Council of India

Pocket-14, Sector-8, Dwarka,

New Delhi 110 077

F O R E W O R D

Medical education has its deep rooted relevance with reference to creation of trained health manpower in the country capable of shouldering the onus and responsibility ensuring an effective health care delivery system. It is the prime concern upper most in the minds of all concerned as to whether the said dispensation is mitigated adequately or otherwise? Attainment on this count in my opinion is a ‘minimum must’ and therefore all ‘initiatives’ with concrete cause are warranted towards realistic and meaningful actualization of the same.

The crystallization of objectives ensuring corresponding curriculum with appropriate teaching learning strategies, tools, techniques and technology and commensurate mode of assessment are the parts of the core model for providing quality based undergraduate medical education.

It gives me great satisfaction that the ‘competency based curriculum’ that has been proposed by the Medical Council of India would definitely serve a larger cause in the domain of ‘quality centricity’.

The “Conative domain” which hitherto was not appropriately incorporated and structured in the curriculum has been specifically dispensed of by providing a definitive model for the same titled AETCOM “Attitude, Ethics and Communication Model”.

Structuring them into competencies, placing them appropriately in the curriculum design ensuring its incorporation through desired teaching and learning would definitely ensure enrichment of the learner with desired communicative and

altruistic skills with proper orientation pertaining to ethics, professionalism, leadership skills and also the attribute that shall inculcate in him/her the essence of lifelong learning.

This definitely would go a long way in creating an 'Indian Medical Graduate' to realistically turn out to be an 'International Medical Graduate' capable of catering to the cause and requirement of health care delivery across the boundaries all over the Globe.

I record my appreciation for Dr. Ved Prakash Mishra, Chairman, Academic Committee and his team for venturing into the said much desired exercise and giving it the required shape out of committed painstaking labour. I am sure that this is going to change the 'shape' and 'face' of undergraduate medical education to make it timely relevant, purposive, need based, consequential and impactful.

(Dr. Jayshree Mehta)

Dr. Vedprakash Mishra
Chairman
Academic Committee
Medical Council of India

Date : 15.09.2017

FOREWORD

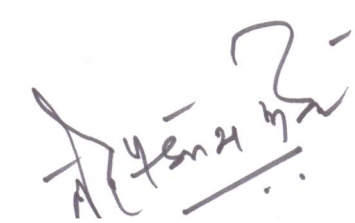
Health Professions and practice is a complex interplay of Knowledge, Clinical Skills & Acumen, Communication, Attitude, Inter- Professional behavior and is largely dependent on strong Ethical values. India, as one of the major stakeholders towards contribution of world's health care, offers a major share of health professionals across the globe. Hence; more so than ever; it needs a curriculum which is better aligned with Health professional attributes that are locally relevant and globally adaptive. This realization; though has struck every health professional of our country; the efforts to effectively deal with the issue was sparsely articulated in its entirety. Teaching and learning of medical ethics, behavioral science, communication skills, and managerial skills have not received due attention in the existing medical curriculum. The proposed AETCOM module is a manifestation of this realization that endeavors to strike a balance between the five identified roles of an 'Indian Medical Graduate (IMG)' viz; Clinician, Leader & Member of health care team, Communicator, Life- long learner and Professional; right from the 1st professional year of training.

The entire concept of AETCOM module lies on the fundamental principle that changing a person's attitude can change his or her behavior. The Cognitive components of attitudes are more fundamental and constant over time and more closely connected to basic values. Behavioural attitudes are manifestations of underlying cognitive and affective attitudes. Ethical dimensions play a crucial role in behavioral evolution and the basic building block of good communication is the feeling that every human being is unique and of value.

There are many new key areas recommended in the AETCOM module that are identified for implementation across the entire duration of the course. It is hoped that

the successful implementation of the AETCOM modules will be forerunner of the transition to competency based undergraduate medical education program envisaged by the Medical Council of India. This booklet and other electronic resources provide background concept, session guidelines and other resources for these sessions that will be useful for all faculty involved in conducting these sessions. These are conceptual frameworks only and Institutions and faculty are at liberty to make modifications while implementing the same at their own settings.

It is genuinely expected that this module plays a vital role in providing a coherent picture of how Attitude, Communication and Bioethics can be integrated within medical curriculum and also inspire medical teachers to make it more meaningful and consequential. The effort is surely a new vista to Medical education making it more comprehensive and relevant to health needs of the society.



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FOREWORD

Medical education today has recognized the need to teach and evaluate professionalism as a formal concept due to increasing concerns about physicians' conflict of interest with patients and relatives and possible loss of licensure. The need of the hour is to train medical professionals in this important area of clinical practice but is often ignored. The diagnostic capability of a doctor is greatly enhanced if the doctor is able to effectively communicate with the patient and his/her relatives decreasing frustration of the doctor and patient or relatives. It has been aptly stated that "Medicine is an art whose magic and creative ability have long been recognized as residing in the interpersonal aspects of patient-physician relationship" (Hall, Roter & Rand, 1981).

Having recognized the pivotal role of effective interpersonal communication between doctor and patient in clinical training and practice, the Medical Council of India has embarked on an ambitious and robust Faculty Development Programme in which medical college teachers are trained to acquire theoretical and practical skills in teaching. The Council has also revised and remodeled the Graduate Medical Education Regulations, 1997 with emphasis on curricular reforms. Teaching curricula in various disciplines would be based on a competency based format with emphasis on domains of attitude, ethics and communication, as envisaged in the AETCOM (Attitude, Ethics and Communication) module.

The AETCOM (Attitude, Ethics and Communication) module was prepared by the Academic Cell of the Council under the inspiring leadership of Dr. Ved Prakash Mishra, Chairman, Academic Committee and ably supported by Dr. M. Rajalakshmi, Academic Cell and the members of the Reconciliation Board headed by Dr. Avinash Supe to guide medical institutions and faculty to acquire the much needed competencies in the attitude, ethics and communication domains. I am extremely grateful to all of them for their painstaking efforts in giving shape to such a well structured document and congratulate them for the same. I am sure effective implementation of the revised Graduate Medical Education Regulations would go a long way in improving the standards of medical education in the country.

Dr. Reena Nayyar

Attitude, Ethics & Communication (AETCOM) competencies

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PREFACE

The Medical Council of India has prepared revised Graduate Medical Education Regulations 2017 and competency based UG curricula, accompanied by guidance for its implementation. In response to this, every medical college needs to develop the capacity to adapt to the requirements of the new guidelines. Earlier experience with implementation of curricular changes suggests that a carefully managed, sustainable approach is necessary to ensure that every college has access to these new skills and knowledge. Faculty development has been seen to play a key role in the implementation and sustenance of any curricular reforms.

The Medical Council of India has decided to implement Attitude, Ethics and Communication module (AETCOM) in all medical schools across the country over the next two years. It is against this backdrop that the AETCOM module is prepared along with facilitators guide. This activity has been supported wholeheartedly by the President of Medical Council of India, Dr. Jayshree Mehta and under the inspiring guidance of Dr. Ved Prakash Mishra, Chairman, Academic Committee and whole hearted support of Dr. Reena Nayyar, Secretary-in-charge, Medical Council of India. There are many new key areas recommended in the AETCOM module that were identified for implementation across the entire duration of the course. It is hoped that the successful implementation of the AETCOM module would be the forerunner of the transition to competency based undergraduate medical education program envisaged by the Medical Council of India.

This booklet and other electronic resources provide background concept, session guidelines and other resources for these sessions. These will be useful for all faculty involved in conducting these sessions. These are conceptual frameworks only and institutions and faculty are at liberty to make modifications while implementing the same at their own settings.

It is proposed that the existing network of MCI Nodal and Regional Centers and Medical Education Units of all medical colleges will be the torchbearers of this transformational change. We hope that such a change will significantly impact the quality of community health and patient care in our country.

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Attitude, Ethics and Communication (AETCOM) Competencies

for the

Indian Medical Graduate

Preamble/Concept

The overall goal of undergraduate medical education program as envisaged in the revised Graduate Medical Education Regulations - 2017 is to create an "Indian Medical Graduate" (IMG) possessing requisite knowledge, skills, attitudes, values and responsiveness, so that she or he may function appropriately and effectively as a physician of first contact of the community while being globally relevant. In order to fulfill this goal, the IMG must be able to function appropriately, ethically and effectively in her/his roles as clinician, leader and member of the health care team and system, communicator, lifelong learner and as a professional. In order to effectively fulfill the above mentioned roles, the IMG must obtain a set of competencies at the time of graduation. In order to ensure that training is in alignment with the goals and competencies, Medical Council of India has proposed new teaching learning approaches including a structured longitudinal programme on attitude, ethics and communication.

Role modelling and mentoring associated with classical approach to professional apprenticeship has long been a powerful tool. This approach alone is no longer sufficient for the development of a medical professional. The domains of attitude and communications with emphasis on ethics therefore need to be taught directly and explicitly throughout the undergraduate curriculum. The two major aspects of teaching professionalism include explicit teaching of cognitive base and stage appropriate opportunities for experiential learning and reflection throughout the curriculum.

AETCOM module has been prepared as a guide to facilitate institutions and faculty in implementing a longitudinal program that will help students acquire necessary competence in the attitudinal, ethical and communication domains. It offers framework of competencies that students must achieve. It also offers approaches to teaching learning methods. However, it is a suggested format and institutions can develop their own approaches to impart these competencies.

How to use this document

This document is a guide to facilitate institutions and faculty in implementing a longitudinal program that will help students acquire necessary competence in the attitude, ethics and communication domains. The purpose of this program is to allow the graduate to function in roles envisaged in the revised Graduate Medical Education Regulations, 2017 (GMR 2017). The revised GMR 2017 document creates roles for the graduate that goes beyond the traditional knowledge and skill components. In particular, it adds four roles – leader and member of the health care team, communicator, life-long learner and professional - which call for learning and skills not addressed by the traditional syllabi.

The document is divided into the following:

1. **Section I:** contains an extract of the goals, roles and universal competencies as envisaged in the GMR 2017 document. This is the base document upon which all learning in the undergraduate years must be based and lists the final competencies that all students must achieve.
2. **Section II:** contains suggested teaching modules for each professional year including resources cases and methods to teach.
3. **Section III:** contains a list of additional non-core competencies that form a desirable set of learning.
4. **Section IV**: is a competency log that contains a list of skills that may be acquired prior to graduation. These skills are best imparted in a simulated setting (usually involving standardized patients). They are also best done progressing in complexity over time. For example, a skill on communicating treatment options may be acquired at different levels of complexities spread over phases before finally being certified.
5. **Section V:** contains formative elements that are observable by tutors/mentors/guides and marked over time with appropriate feedback in a non-punitive fashion.
6. **Appendix 1**: consists of the entire set of competencies as approved by the Academic Committee of the Medical Council of India.
7. **Appendix 2**: provides a modified communication skill rating tool adapted from the Kalamazoo consensus.

Definitions

1. **Goal:** A projected state of affairs that a person or system plans to achieve.

   In other words: Where do you want to go? or What do you want to become?

2. **Competency:** The habitual and judicious use of communication, knowledge, technical skills, clinical reasoning, emotions, values, and reflection in daily practice for the benefit of the individual and community being served.

   In other words: What should you have? or What should have changed?

3. **Objective:** Statement of what a learner should be able to do at the end of a specific learning experience.

   In other words: What the Indian Medical Graduate should know, do, or behave.

Action Verbs used in this document

Knowledge	Skill	Attitude/communicate
Enumerate	Identify	Counsel
List	Demonstrate	Inform
Describe	Perform under supervision	Demonstrate understanding of
Discuss	Perform independently	
Differentiate	Document	
Define	Present	
Classify	Record	
Choose	Interpret	
Elicit		
Report		

Note:

1. Specified essential competencies only will be required to be performed independently at the end of the final year MBBS.
2. The word ‘perform’ or ‘do’ is used ONLY if the task has to be done on patients or in laboratory practicals in the pre/para- clinical phases.
3. Most tasks that require performance during undergraduate years will be performed under supervision.
4. If a certification to perform independently has been done, then the number of times the task has to be performed under supervision will be indicated in the last column.

Explanation of terms used in this document

Lecture	Any instructional large group method including traditional lecture and interactive lecture
Small group discussion	Any instructional method involving small groups of students in an appropriate learning context
DOAP (Demonstration-Observation - Assistance - Performance)	A practical session that allows the student to observe a demonstration, assist the performer, perform in a simulated environment, perform under supervision or perform independently
Skill assessment	A session that assesses the skill of the student including those in the practical laboratory, skills lab, skills station that uses mannequins/ paper case/simulated patients/real patients as the context demands
Core	A competency that is necessary in order to complete the requirements of the subject (traditional must know)
Non-Core	A competency that is optional in order to complete the requirements of the subject (traditional nice (good) to know/ desirable to know)
National Guidelines	Health programs as relevant to the competency that are part of the National Health Program

Domains of learning

K	Knowledge
S	Skill
A	Attitude
C	Communication

Levels of competency

K	Knows	A knowledge attribute - Usually enumerates or describes
KH	Knows how	A higher level of knowledge - is able to discuss or analyse
S	Shows	A skill attribute: is able to identify or demonstrate the steps
SH	Shows how	A skill attribute: is able to interpret/ demonstrate a complex procedure requiring thought, knowledge and behavior
P	Performs (under supervision or independently)	Mastery for the level of competence - When done independently under supervision a pre-specified number of times - certification or capacity to perform independently results

Note:

In the table of competency - the highest level of competency acquired is specified and implies that the lower levels have been acquired already. Therefore, when a student is able to SH - Show how - an informed consent is obtained - it is presumed that the preceding steps - the knowledge, the analytical skills, the skill of communicating have all been obtained.

It may also be noted that attainment of the highest level of competency may be obtained through steps spread over several subjects or phases and not necessarily in the subject or the phase in which the competency has been identified.

Teaching Learning Methods recommended

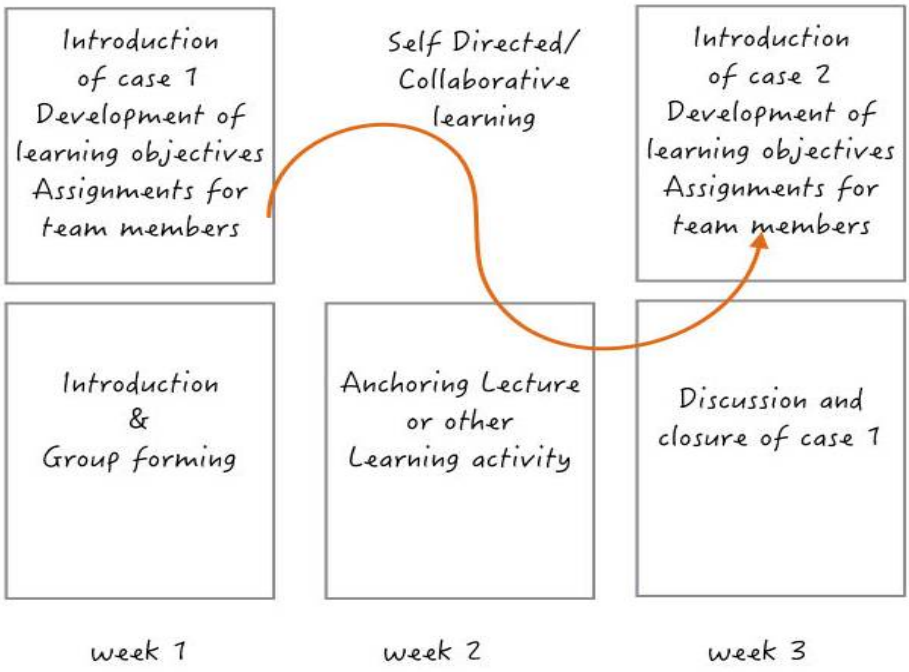
Guidelines for Case Discussion

A hybrid problem-oriented approach is one of the most effective ways for students to explore the various facets of "real life issues" that will confront them in their careers. In addition to problem solving skills, case discussions promote collaborative learning, team work, reflection and self-directed learning. The cases presented in this booklet represent competencies that lend themselves best to this form of learning.

The figure on the following page explains the suggested format of the hybrid problem-based learning method:

1. Two or more learning sessions are recommended for each session with ample time for self-directed learning and other learning activities between each session.
2. A case is introduced into a small group and the facilitator facilitates a small group discussion where,
    a. initial reactions of the group to the case is obtained
    b. the underlying ethical, legal and societal principles of the case are elicited
    c. learning objectives for the case are developed
    d. learning tasks are assigned for members of the learning groups
    e. learning resources are identified
        - The suggested location for such a session is a small group discussion area which requires a small table with seating for 8 - 10 students
        - Suggested duration for such a session is 1 hour
        - A board with chalk or marker is also required
3. Learning occurs in between sessions by the learners through following:
    - Self-directed learning by study of identified learning resources
    - Self-directed learning through study of online learning resources
    - Identification of legal, ethical and social precedents for the given settings
    - Obtaining opinion from seniors in the profession on their impressions on the setting
4. Reinforcement of the fundamental concepts underlying the case can be done through a large group learning session (lecture or equivalent) in between the small group sessions.

5. In the second session, the small group discussion is focussed on closure of the case (or the part of the case) for which learning objectives were identified for in the first session. The facilitators may guide the discussion based on the ethical, legal, societal and communication aspects of the case. The group discusses the case, based on the learning done in between the session and provides suggestions and alternatives on the approach for doctors to follow. It must be reiterated that there may not be one correct way to resolve a case. The approach will be to allow students to reflect, make a choice and defend their choice, based on their values and learning.



The Hybrid PBL model suggested for ATCOM Cases

Student narrative

The student narrative is a learning method that focuses on the following skills:

a. Elicit, observe and record data.
b. Reflect on the data at a higher level of thinking and derive opinions and conclusions.
c. Communicate the observations and conclusions in a written and verbal form and expand on and defend the conclusions with colleagues and teachers.
d. Form new experiences and conclusions based on this discussion.

Section I

Extract from the Graduate Medical Education Regulations, 2017

1. The undergraduate medical education program is designed with a **goal** to create an "**Indian Medical Graduate" (IMG)** possessing requisite knowledge, skills, attitudes, values and responsiveness, so that he or she may function appropriately and effectively *as a doctor of first contact of the community* while being globally relevant.

2. In order to fulfill this goal, the IMG must be able to function in the following **ROLES** appropriately and effectively:

2.1. Clinician who understands and provides preventive, promotive, curative, palliative and holistic care with compassion.

2.2. Leader and member of the health care team and system with capabilities to collect, analyze, synthesize and communicate health data appropriately.

2.3. Communicator with patients, families, colleagues and community.

2.4. Lifelong learner committed to continuous improvement of skills and knowledge.

2.5. Professional, who is committed to excellence, is ethical, responsive and accountable to patients, community and profession.

Global Attitude, Ethics and Communication Competencies addressed in the roles of an Indian Medical Graduate

3. Competencies: Competency based learning would include designing and implementing medical education curriculum that focuses on the desired and observable ability in real life situations. In order to effectively fulfill the roles as listed in item 2 above, the Indian Medical Graduate would have obtained the following set of competencies at the time of graduation:

3.1. Clinician, who understands and provides preventive, promotive, curative, palliative and holistic care with compassion

3.1.1. Demonstrate knowledge of normal human structure, function and development from a molecular, cellular, biologic, clinical, behavioral and social perspective.

3.1.2. Demonstrate knowledge of abnormal human structure, function and development from a molecular, cellular, biological, clinical, behavioural and social perspective.

3.1.3. Demonstrate knowledge of medico-legal, societal, ethical and humanitarian

principles that influence health care.

3.1.4. Demonstrate knowledge of national and regional health care policies including the National Health Mission (NHM), frameworks, economics and systems that influence health promotion, health care delivery, disease prevention, effectiveness, responsiveness, quality and patient safety.

3.1.5. Demonstrate ability to elicit and record from the patient, and other relevant sources including relatives and caregivers, a history that is complete and relevant to disease identification, disease prevention and health promotion.

3.1.6. Demonstrate ability to elicit and record from the patient, and other relevant sources including relatives and caregivers, a history that is contextual to gender, age, vulnerability, social and economic status, patient preferences, beliefs and values.

3.1.7. Demonstrate ability to perform a physical examination that is complete and relevant to disease identification, disease prevention and health promotion.

3.1.8. Demonstrate ability to perform a physical examination that is contextual to gender, social and economic status, patient preferences and values.

3.1.9. Demonstrate effective clinical problem solving, judgment and ability to interpret and integrate available data in order to address patient problems, generate differential diagnoses and develop individualized management plans that include preventive, promotive and therapeutic goals.

3.1.10. Maintain accurate, clear and appropriate records of the patient in conformation with legal and administrative frameworks.

3.1.11. Demonstrate ability to choose the appropriate diagnostic tests and interpret these tests based on scientific validity, cost effectiveness and clinical context.

3.1.12. Demonstrate ability to prescribe and safely administer appropriate therapies including nutritional interventions, pharmacotherapy and interventions based on the principles of rational drug therapy, scientific validity, evidence and cost that conform to established national and regional health programs and policies for the following:

a. Disease prevention,
b. Health promotion and cure,
c. Pain and distress alleviation, and
d. Rehabilitation and palliation.

3.1.13 Demonstrate ability to provide a continuum of care at the primary and/or secondary level that addresses chronicity, mental and physical disability.

3.1.14 Demonstrate ability to appropriately identify and refer patients who may require specialized or advanced tertiary care.

3.1.15 Demonstrate familiarity with basic, clinical and translational research as it applies to the care of the patient.

3.2. Leader and member of the health care team and system

3.2.1 Work effectively and appropriately with colleagues in an inter-professional health care team respecting diversity of roles, responsibilities and competencies of other professionals.

3.2.2 Recognize and function effectively, responsibly and appropriately as a health care team leader in primary and secondary health care settings.

3.2.3 Educate and motivate other members of the team and work in a collaborative and collegial fashion that will help maximize the health care delivery potential of the team.

3.2.4 Access and utilize components of the health care system and health delivery in a manner that is appropriate, cost effective, fair and in compliance with the national health care priorities and policies, as well as be able to collect, analyze and utilize health data.

3.2.5 Participate appropriately and effectively in measures that will advance quality of health care and patient safety within the health care system

3.2.6 Recognise and advocate health promotion, disease prevention and health care quality improvement through prevention and early recognition: in a) life style diseases, and b) cancer in collaboration with other members of the health care team.

3.3. Communicator with patients, families, colleagues and community

3.3.1 Demonstrate ability to communicate adequately, sensitively, effectively and respectfully with patients in a language that the patient understands and in a manner that will improve patient satisfaction and health care outcomes.

3.3.2 Demonstrate ability to establish professional relationships with patients and families that are positive, understanding, humane, ethical, empathetic, and

trustworthy.

3.3.3 Demonstrate ability to communicate with patients in a manner respectful of patient's preferences, values, prior experience, beliefs, confidentiality and privacy.

3.3.4 Demonstrate ability to communicate with patients, colleagues and families in a manner that encourages participation and shared decision-making.

3.4. Lifelong learner committed to continuous improvement of skills and knowledge

3.4.1 Demonstrate ability to perform an objective self-assessment of knowledge and skills, continue learning, refine existing skills and acquire new skills.

3.4.2 Demonstrate ability to apply newly gained knowledge or skills to the care of the patient.

3.4.3 Demonstrate ability to introspect and utilize experiences, to enhance personal and professional growth and learning.

3.4.4 Demonstrate ability to search (including through electronic means), and critically evaluate the medical literature and apply the information in the care of the patient.

3.4.5 Be able to identify and select an appropriate career pathway that is professionally rewarding and personally fulfilling.

3.5. Professional who is committed to excellence, is ethical, responsive and accountable to patients, community and the profession

3.5.1 Practice selflessness, integrity, responsibility, accountability and respect.

3.5.2 Respect and maintain professional boundaries between patients, colleagues and society.

3.5.3 Demonstrate ability to recognize and manage ethical and professional conflicts.

3.5.4 Abide by prescribed ethical and legal codes of conduct and practice.

3.5.5 Demonstrate a commitment to the growth of the medical profession as a whole.

Assessment of skills related to Attitude, Ethics and Communication

Assessment is a vital component of competency based education. In addition to making the pass/fail decisions, a very important role of assessment is to provide feedback to the learner and help him/her to improve learning. The assessment in AETCOM nodule has been designed with this purpose. The teachers should use this opportunity to observe the performance and provide feedback based on their observations. In case a student has demonstrated a performance, which is considered below expectation, corrective action including counseling should be initiated. Many of the tools in this module may appear subjective but coupled with the experience of the assessor, they will serve a very useful purpose.

Section II

Learning modules for Professional year I

Number of modules: 5

Number of hours: 34

Module 1.1: What does it mean to be a doctor?

Background

It is important for new entrants to get a holistic view of their profession, its ups and downs, its responsibilities and its privileges. It is important to start this discussion early in their careers when their minds are still fresh with the thrill of joining medical school. Such a discussion will help them remember the big picture through the program and remind them why they have chosen to be doctors.

Competencies addressed

The student should be able to:	Level
1. Enumerate and describe professional qualities and roles of a physician	KH
2. Describe and discuss the commitment to lifelong learning as an important part of physician growth	KH
3. Describe and discuss the role of a physician in health care system	KH
4. Identify and discuss physician's role and responsibility to society and the community that she/ he serves	KH

Learning Experience

Year of study: Professional year 1

Hours: 8 (6 hours + 2 hours self-directed learning)

i. Exploratory session- 1 hour
ii. Facilitated panel discussion – 2 hours
iii. Self-directed learning - 2 hours
iv. Introductory visit to the hospital – 2 hours
v. Discussion and closure of case - 1 hour

1. An exploratory session with the students to find out (a) why they chose to become doctors, (b) what do they think are the privileges and the responsibilities of the profession, (c) what do they expect from society and what do they think society expects from them, and (d) what will they have to do and give up in order to meet their own and society's expectations. This is preferably done in a small group discussion.

2. A facilitated panel discussion involving doctors who are at different stages of their careers (senior, midlevel, young) during which these doctors share their experiences and also answer questions from the students.
3. Self-directed learning where students write a report from reflections based on sessions 1 & 2 and on other reading materials, TV series, movies etc. that they have chosen from the lay press about doctors' experiences.
4. Introductory visit to the hospital / community medical centres
5. A closure session with students to share their reflections based on 1, 2, 3 and 4 that includes their plans for the next 5 years in order to fulfill their professional and personal roles as doctors.
6. A coat ceremony in the Foundation Course may be considered. A white coat ceremony is held in many institutions, as a symbolic transition of the medical student prior to their first day of exposure to clinical teaching, in order to emphasize the importance of their new role as budding doctors.

Assessment

1. **Formative:** not required
2. **Summative:** not required

Resources

1. Whitcomb ME. What does it mean to be a physician? Acad Med.2007; 82: 917-8.
2. Eisenberg C. It is still a privilege to be a doctor? N Engl J Med 1986; 314:1113-1114.
3. Ofri D. Neuron overload and the juggling doctor. The Lancet 2010; 376: 1820 – 21.

Module 1.2: What does it mean to be a patient?

Background

Doctors deal with human suffering throughout their professional careers. A balanced approach to the patient care experience requires an understanding of patients, illnesses, their concepts of suffering, coping mechanisms, the role of the doctor, an exploration of empathy vs equanimity and the difference between healing and curing. An introduction to this fundamental but complex field is important in the first Professional year. An introductory experience will allow students to keep the patient experience in perspective during their learning.

Competencies addressed

The student should be able to:	Level
1.Enumerate and describe professional qualities and roles of a physician	KH
2. Demonstrate empathy in patient encounters	SH

Learning Experience

Year of study: Professional year 1

Hours: 8 (6 hours + 2 hours self-directed learning)

i. Exploratory session - 2 hours
ii. Hospital visit - 2 hours
iii. Self-directed learning - 2 hours
iv. Discussion and closure of case - 2 hours

1. An exploratory session with the students enquiring from them about their views on health, disease and suffering. Discussion could involve their personal ill health or involving someone they know among their families and friends. How did that experience affect them? What do they believe patients feel and go through? How does it affect patient's behaviour, outlook and expectations?
2. Students are assigned to patients in the hospital, interview them about their experiences, reactions, emotions, outlook and expectations.
3. Self-directed learning where students write a report from reflections based on sessions 1 & 2 and on other readings, TV series movies etc.
4. A closure session with students to share their reflections based on 1, 2 and 3.

Assessment

1. **Formative:** The student may be assessed based on their active participation and presentation (written and oral).
2. **Summative:** SAQ

Module 1.3: The doctor-patient relationship

Background

The doctor-patient relationship is the cornerstone to effective patient care. This session builds on the previous two sessions which address doctors and patients and attempts to explore the fundamental basis of the doctor-patient contract, its rules, boundaries and duties. It provides an introduction to the nature of relationship, importance of communication, honesty, transparency, shared responsibility, equality and vulnerability. This introductory session, though complex, will provide an overview for the student to provide them with a perspective on the doctor-patient relationship throughout their years of study.

Competencies addressed

The student should be able to:	Level
1.Enumerate and describe professional qualities and roles of a physician	KH
2. Demonstrate empathy in patient encounters	SH

Learning Experience

Year of study: Professional year 1

Hours: 7 hours (5 hours + 2 hours of self-directed learning)

i. Large group session- 1 hour
ii. Self-directed learning - 2 hours
iii. Interactive discussions – 2 hours
iv. Discussion and closure – 2 hours

1. Anchoring a large group session emphasising the fundamentals of the doctor- patient relationship (1 hour).
2. Self-directed/Guided learning by students on the doctor-patient relationship that includes learning from resources, lay press, media and movies (2 hours).
3. An interactive discussion in a small group, based on session 1, with illustrative cases. Examples of cases that can be used are provided in the resources section (2 hours) (or) a patient-doctor encounter observation with checklist may be used.
4. A closure session with reflection by the students, based on items 1, 2 and 3.

Assessment

1. **Formative:** The student may be assessed based on their active participation in the sessions. A written critique of the situations discussed in item 2 may be used for formative assessment.
2. **Summative:** Short questions for example a) rights of patients, b) responsibilities of patients, c) duties of doctors, and d) boundaries of the doctor-patient relationship.

Resources

1. http://www.cpso.on.ca/policies-publications/the-practice-guide-medical-professionalism-and-col/principles-of-practice-and-duties-of-physicians

Case for discussion 1:

A 53 year old man is seen by a cardiologist for chest pain lasting for a few minutes on accustomed exercise for the past 3 weeks. After a detailed history and physical examination, the doctor orders an ECG which was normal. He further orders an exercise stress test which showed reversible ischemia. The doctor orders an angiogram. At the time, the patient requests that he would like to have a second opinion. The cardiologist explains that he has done everything correctly and that the patient indeed requires an angiogram. The patient tells him that he cannot make a decision unless he talks to his family doctor of 20 years. The cardiologist is offended and tells the patient that he does not wish to see the patient any longer.

Points for discussion:

1. Trust in the doctor-patient relationship.
2. Rights of a patient, Duties of a doctor.
3. Does the request for a second opinion provide sufficient grounds to terminate the doctor-patient relationship?

Case for discussion 2:

A young doctor has been taking care of an 86 year old woman for the past 2 years. She had a fall 2 years ago and has been mostly bed ridden. She lives alone with just a care taker and her children are abroad. She requires preventive care mostly and the doctor makes house visits once a week. The doctor spends time talking to her during each

visit and makes her feel comfortable. One day during such a visit, the patient expresses the view that her children have been ungrateful to her and that she intends to call her lawyer today and divide her assets between the doctor and the caretaker after her death. What should the doctor do?

Points for discussion:

1. Boundaries in the doctor-patient relationship.
2. Trust and vulnerability in doctor-patient relationship.

Resources:

1. AMA Code of Medical Ethics: https://www.ama-assn.org/delivering - care/ama-code-medical-ethics (for case 1)
2. https://www.dovepress.com/getfile.php fileID=1351 (for case 2)

Module 1.4: The foundations of communication - 1

Background

Communication is a fundamental prerequisite in the medical profession and bedside clinical skills is crucial in ensuring professional success for doctors. This module provides students with an introduction to doctor-patient communication. The Kalamazoo consensus statement[1] provides a working model of teaching communication skills and may be used to impart communication skills. The five 'A's elements of behaviour change model may also be used. Effective listening, verbal and nonverbal communication and creating respect in patient encounters would be the skills that would be introduced.

Competency addressed

The student should be able to:	Level
Demonstrate ability to communicate to patients in a patient, respectful, non-threatening, non- judgmental and empathetic manner	SH

Learning Experience

Year of study: Professional Year 1

Hours: 7 hours (5 hours + 2 hours self-directed learning)

i. Large group session- 2 hours
ii. Self-directed learning - 2 hours
iii. Small group discussions – 2 hours
iv. Discussion and closure – 1 hour

Contents:

This module includes 3 interdependent learning sessions:

1. Introductory large group sessions on the principles of communication.
2. Self-directed/Guided learning by students on the importance and techniques of effective communication.
3. Small group sessions on improving communication. These sessions can include either videos or role play highlighting common mistakes in patient - doctor communication and allowing students to identify these mistakes and discussing on how to correct them. Situations that can be used include: a) a noisy ambience with a distracted doctor

who is multitasking, b) lack of eye contact, c) doctor who keeps on interrupting patients and not listening, d) doctor who talks down to patients etc.

4. Closure session with reflection by students in a small group based on sessions 1, 2 and 3 and with emphasis on learning done and future directions.

Assessment

1. **Formative:** The student may be assessed based on their active participation in the sessions. A written critique of the situations discussed in item 3 may be used for formative assessment.
2. **Summative:** may be deferred for later phases.

Resource:

1. Makoul G. Essential elements of communication in medical encounters: the Kalamazoo consensus statement. Acad Med. 2001; Apr; 76(4): 390-3.

Module 1.5: The cadaver as our first teacher

Background

Medical students enter college and their first and lasting encounter is with the cadaver. Respect for cadaver as a teacher translates later into respect for human beings as teachers and a lifelong respect for learning. Throughout the world the emphasis on "humanizing" the cadaver with respect as first patient or first teacher has gained momentum.

Competency addressed

The student should be able to:	Level
Demonstrate respect and follows the correct procedure when handling cadavers and other biologic tissues	SH

Learning Experience

Year of study: Beginning and end of Professional year 1

Hours: 4 (2+2) hours

i. Opening session- 2 hours

ii. Closing session - 2 hours

Contents:

1. An initial introductory session (large or small group) should be on the importance of biologic tissues and cadavers in their learning. The discussion should focus on the fact that some of these cadavers were unclaimed but also many of them are an anatomic gift by families; respect for donor families, cadavers and tissues is important and must be respected. The session should include safe and clean handling and disposal of biologic tissues (2 hours).
2. A session at the end of phase is a small group or large group discussion with reflective presentations by students on how the cadaver helped them to learn, their experience with dissection etc. These sessions should allow the students to display their creativity and may include prose, poetry, sketches etc. An example of such a project is found in the resources section (2 hours).

Assessment

1. **Formative:** The student may be assessed based on their active participation in the sessions. The respect and the manner in which students handle biologic tissues throughout the phase may be part of the overall formative assessment of the student.
2. **Summative:** may not be required.

Resource: http://medicine.yale.edu/education/donation/reflections/ (An example of the project is found here).

Learning modules for Professional Year II

Number of modules: 8

Number of hours: 37

Module 2.1: The foundations of communication - 2

Background

Communication is a fundamental prerequisite of the medical profession and beside skills is crucial in ensuring professional success for doctors. This module continues to provide an emphasis on effective communication skills. During professional year II, the emphasis is on active listening and data gathering.

Competency addressed

The student should be able to:	**Level**
Demonstrate ability to communicate to patients in a patient, respectful, non-threatening, non- judgmental and empathetic manner	SH

Learning Experience:

Year of study: Professional year 2

Hours: 5 (1 + 2 +1+1)

i. Introductory small group session - 1 hour
ii. Focused small group session - 2 hours
iii. Skills lab session – 1 hour
iv. Discussion and closure – 1 hour

Contents:

This module includes 2 interdependent learning sessions:

1. Introductory small group session on the principles of communication with focus on opening the discussion, listening and gathering data.
2. Focused small group session with role play or videos where the students have an opportunity to observe, criticise and discuss common mistakes in opening the discussion, listening and data gathering.
3. Skills lab sessions where students can perform tasks on standardised or regular patients with opportunity for self critique, critique by patient and by the facilitator.

Assessment

1. **Formative:** Participation in session 2 and performance in session 3 may be used as part of formative assessment.
2. **Summative:** may be deferred.

Resources:

1. Makoul G. Essential elements of communication in medical encounters: the Kalamazoo consensus statement. Acad Med. 2001; Apr; 76(4): 390-3.
2. Hausberg M. Enhancing medical students' communication skills: development and evaluation of an undergraduate training program. BMC Medical Education 2012; 12:16.

Module 2.2 The foundations of bioethics

Background

An introductory session in a large group that provides an overview of the evolution and the fundamental principles of bioethics including the cardinal pillars of ethics viz., autonomy, beneficence, non-maleficence and justice.

Competencies addressed

The student should be able to:	Level
1. Describe and discuss the role of non-maleficence as a guiding principle in patient care	KH
2. Describe and discuss the role of autonomy and shared responsibility as a guiding principle in patient care	KH
3. Describe and discuss the role of beneficence of a guiding principle in patient care	KH
4. Describe and discuss the role of a physician in health care system	KH
5. Describe and discuss the role of justice as a guiding principle in patient care	KH

Learning Experience

Year of study: Professional year 2

Hours: 2 large group session - 2 hours

Contents:

This module is a large group learning session that can be made interactive by illustrative examples.

Assessment

Summative: Short notes on a) Autonomy b) Beneficence c) Non-maleficence

Resource:

A review of the four principles of bioethics is found here: http://archive.journalchirohumanities.com/Vol%2014/JChiroprHumanit_2007_v14_34-40.pdf

Module 2.3: Health care as a right

Background

This session is aimed at introducing students to health care systems, their access, equity in access, the impact of socio-economic situations in determining health care access and the role of doctors as key players in the health care system.

Competency addressed

The student should be able to:	Level
Describe and discuss the role of justice as a guiding principle in patient care	KH

Learning Experience

Year of study: Professional year 2

Hours: 2

i. Participatory student seminar - 2 hours

Contents:

This module may be done as a participatory student seminar with debates on the more controversial issues to increase a reflective process.

Focus may be on:

1. Is health care a right?
2. What are the implications of health care as a right?
3. What are the social and economic implications of health care as a right?
4. What are the missing links? (see resource 2 for a brief overview) and
5. What are the implications for doctors?

Assessment

Summative: Short note on barriers to implementation of health care as a universal right.

Resources

1. The Universal Declaration of Human Rights. http://www.un.org/en/documents/udhr/
2. Missing links in universal health care. http://www.thehindu.com/opinion/lead/missing-links-in-universal-health-care/article6618667.ece

Module 2.4: Working in a health care team

Background

This session is aimed at introducing students to health care systems and their functioning. It allows students to "tag along" with members of health care teams, observe their work and gain experience about their perspectives. It is hoped that this experience will help students to understand the need for collaborative work in health care, how each member of the health care team is important and also develop respect.

Competencies addressed

The student should be able to:	Level
1. Demonstrate ability to work in a team of peers and superiors	SH
2. Demonstrate respect in relationship with patients, fellow team members, superiors and other health care workers	SH

Learning Experience

Year of study: Professional year 2

Hours: 6 hours (4 hours "tag along" + 2 hours discussion)

i. "Tag along" session in hospital- 2 x 2 hours

ii. Small group discussion session - 2 hours

Contents:

This module may be done as two interdependent sessions:

1. A "tag along" session where students spend time with other health care workers including nurses, technicians and others, observe their work, their interactions, conduct a small interview with them and write a narrative based on this interview.
2. A small group discussion which is based on the students' observations, experiences, reflections and inferences and what must be done by them to work as an integral part of the health care team.

Assessment

Formative: Student participation in session 2 with assessment of submitted narrative.

Module 2.5: Bioethics continued – Case studies on patient autonomy and decision making

Background

The important parts of ethical care of the patient are best learnt in a hybrid problem-based format with additional lectures and other sessions that allow students to learn collaboratively with different learning styles. A guide for case discussion is provided in the resources section of this module and may be used as a guide for other modules. The key element is that students remain in the same group with the same facilitator since groups mature in their learning over time.

Competency addressed

The student should be able to:	Level
Identify, discuss and defend medico-legal, socio-cultural and ethical issues as it pertains to patient autonomy, patient rights and shared responsibility in health care	KH

Learning Experience

Year of study: Professional year 2

Hours: 6

i. Introduction and group formation - 1 hour
ii. Case introduction - 1 hour
iii. Self-directed learning - 2 hours
iv. Anchoring lecture - 1 hour
v. Case Resolution - 1 hour

Case: The Cover Up

You evaluate Mrs. Lakshmi Srinivasan who is a 48 year old woman presenting with lymphadenopathy. She had been complaining of mild fever and weight loss for the past 4 -5 months. Examination of the neck shows large rubbery lymph nodes that are present also in the axilla and the groin. There is a palpable spleen. She is accompanied by her caring husband.

Lakshmi undergoes a lymph node biopsy and the pathologist calls you and tells you that she has a lymphoma. That evening Mr. Srinivasan comes in first into your office and leaves the report on your table. As you read the description you realise that the final diagnosis has been altered to Tuberculosis by whitening out the pathologist's report. When you look up he tells you –"Sir, I googled lymphoma - it is almost like a cancer. My wife can't handle that diagnosis. She has always been a worried frightened person. I want you to tell my wife that she had TB. She is waiting outside, doctor. I thought I will call her in after I had a chat about this with you".

Points for discussion:

1. Does the patient have a right to know their diagnosis?
2. What should the patient be told about their diagnosis, therapy and prognosis?
3. How much should be told to a patient about their illness?
4. Are there exceptions to full disclosure? Can family members request withholding of information from patient?

Assessment

1. **Formative:** The student may be assessed based on their active participation in the sessions.
2. **Summative:** Short questions on: 1) Define patient autonomy, 2) Contrast autonomy and paternalism, 3) What are the responsibilities of patients and doctors in shared decision making? 4) What is full and reasonable disclosure?

The suggested location, duration and requirements are as in item 2.

Once the case (or part of the case) is resolved, the next case (or the next part of the case) is introduced.

Module 2.6: Bioethics continued: Case studies on autonomy and decision making

Background

This introduces the student to further issues in autonomy including competence and capacity to make decisions (also see module 2.5).

Competency addressed

The student should be able to:	Level
Identify, discuss and defend medico-legal, socio-cultural and ethical issues as they pertain to refusal of care including do not resuscitate and withdrawal of life support	KH

Learning Experience

Year of study: Professional year 2

Hours: 5

i. Introduction of case - 1 hour
ii. Self-directed learning - 2 hours
iii. Anchoring lecture - 1 hour
iv. Discussion and closure of case - 1 hour

Case: Life on a machine

You are taking care of 78-year-old Mrs. Mythili who was living all alone in an apartment with only a live-in caretaker, 3 streets away from your clinic. She is a widow and her only son emigrated to the US 32 years ago. He visits her once a year. One year ago, she had a fall with a hip fracture that healed badly. She has hypertension which is reasonably controlled on medications. She continues to come to your clinic once a month. Four months ago, she spent some time talking about her sister who recently died following metastatic breast cancer. “My sister suffered a lot, Doctor - they put a tube down her throat to breathe. Even when her heart stopped they kept thumping her chest - it was awful. If I ever fall sick I don't want to go through all this. Promise me, doctor, that you won’t do all of this to me. I have lived all alone since my husband died but I have lived independently - now I don't want to depend on a machine to live”. You had reassured her that she would be ok and this was just the recent death of her sister affecting her. On subsequent visits she would still bring up this issue and

state that there was no use of her living as a burden to anyone and that no one should endure what her sister had undergone.

One day you get a call from the Emergency Room of the local hospital stating that Mrs. Mythili has been admitted by the caretaker. She had developed fever and shortness of breath. She was brought hypoxic to the emergency room and they had intubated her. Chest X ray revealed a large pneumonic patch. Laboratory testing revealed hyponatremia.

When you visited her she is somewhat drowsy, intubated and restrained. The nurse tells you that she is sometimes lucid; at other times not even able to recognise her son who was there since this morning. She points out at the ET and makes a pleading gesture to remove it. Her son accosts you in the hallway. He tells you that he got a call while he was traveling in Singapore and took the first flight out to be with his mom. He was very distressed at his mother's health and that he wants "everything" possible done for her. You ask him if she had ever indicated what she wanted to be done if she were to require hospitalization and intubation - he says that he used to speak to her every month on the phone and she was always cheerful and enquiring about her grandchildren but did not talk about her health.

Points for discussion:

1. Extent of patient autonomy.
2. Elements in decision making: Competency vs Capacity.
3. Surrogacy in decision making.
4. Autonomy vs beneficence.
5. How much does family wishes count?
6. Legal, ethical and social aspects of 'Do not resuscitate'.

Assessment

1. **Formative:** The student may be assessed based on their active participation in the sessions.
2. **Summative:** Short questions on:
   a) What determines decision making capacity and competency.
   b) Who has the right to make decisions for a patient who cannot determine for himself.

Resources: See Module 2.5

Module 2.7: Bioethics continued: Case studies on autonomy and decision making

Background

This introduces the student to further issues in autonomy including informed consent and refusal (also see module 2.5).

Competency addressed

The student should be able to:	Level
Identify, discuss and defend, medico-legal, socio-cultural and ethical issues as they pertain to consent for surgical procedures	KH

Learning Experience

Year of study: Professional year 2

Hours: 5

i. Introduction of case - 1 hour
ii. Self-directed learning - 2 hours
iii. Anchoring lecture - 1 hour
iv. Discussion and closure of case - 1 hour

Case: Who is the doctor?

A 54 year old man named Mr. Surendra Patel is admitted for acute chest pain in a medical centre. His father had died of a myocardial infarction at the age of 60. Two years ago, his brother had been admitted to a hospital with a myocardial infarction and had died after complications following an angioplasty. Mr. Patel is a diabetic and is on multiple oral hypoglycemic agents with moderate control. He is a businessman with his own small industry. After initial stabilization, the patient is comfortable and pain-free after analgesics, nitrates and statins. Preliminary blood tests and ECG confirm an acute coronary event. The next morning, the senior cardiologist makes rounds and reviews the patient. “You have unstable angina, Mr. Patel and require an angiogram. You may also require either a stent or coronary bypass after the procedure. The nurse will provide you with the necessary paperwork. Please sign it and I will plan the procedure for 4.35 AM tomorrow morning.”. “Doctor sahib”, asked Mr. Patel, “I am not comfortable with the idea of an angiogram; my brother died on the table when an angioplasty was being done. Aren’t there other tests that

you can do? I am not happy with this option". "Your brother would have had it with someone else, Mr. Patel - I have the best hands in town; nothing will happen when I do it" retorted the cardiologist. "But aren't there any other options to see what I have? Is this the only test? I have read somewhere that you can do a CT angiogram", persisted Mr. Patel. "Are you the doctor or am I the doctor?" retorted the cardiologist angrily. "If you are ready to do as I say, sign the papers and I will see you in the Cath lab tomorrow. Otherwise you are free to get discharged". He stomped out.

Points for discussion:

1. Extent of patient autonomy.
2. Informed consent and informed refusal.
3. Conflict between autonomy and beneficence.
4. What should the patient be told about a procedure?
5. What must the informed consent include?

Assessment

1. **Formative:** The student may be assessed based on their active participation in the sessions.
2. **Summative:** Short questions on 1) What is informed consent? 2) What is informed refusal?

Resources

See module 2.5

Module 2.8: What does it mean to be family member of a sick patient?

Background

Doctors deal with human suffering throughout their professional careers. A balanced approach to the patient care experience requires an understanding of support systems of patients, priorities coping and emotions of families, the role of the doctor, an exploration of empathy vs equanimity and the difference between healing and curing and support.

Competency addressed

The student should be able to:	Level
Demonstrate empathy in patient encounters	SH

Learning Experience

Year of study: Professional year 2

Hours: 6 (includes 2 hours of SDL)

i. Hospital visit & interviews - 2 hours
ii. Large Group Discussions with patients' relatives - 1 hour
iii. Self-directed Learning - 2 hours
iv. Discussion and closure - 1 hour

1. Students are assigned to patients in the hospital, interview their family about their illnesses, experience, reactions, emotions, outlook and expectations (or can be done in a controlled environment with standardised patients.
2. Family members of patients with different illnesses may be brought to a large group discussion with permission and an interactive discussion (based on the items outlined in option A. Can use standardised patients)
3. Self-directed learning where students write a report from reflection based on sessions 1 & 2 and on other readings, TV series, movies etc.
4. A closure session with students to share their reflections based on 1, 2 and 3 so that it includes how they intend to incorporate the lessons learnt in patient care.

Assessment

1. **Formative:** The student may be assessed based on their active participation in the sessions and submission of the written narrative.
2. **Summative:** Short questions on the role of doctors in the community and expectations of society form doctors.

   e.g. 1. What is empathy? What is the role of empathy in the care of patients?

Learning modules for Professional Year III

Number of modules: 5

Number of hours: 25

Module 3.1: The foundations of communication - 3

Background

Communication is a fundamental prerequisite of the medical profession and beside skills is crucial in ensuring professional success for doctors. This module builds on the listening skills developed in professional year II. The Kalamazoo consensus statement provides a working model of teaching communication skills and may be used to impart communication skills. Skills, that will be introduced, should include "dealing with emotion".

Competency addressed

The student should be able to:	Level
Demonstrate ability to communicate to patients in a patient, respectful, non-threatening, non-judgmental and empathetic manner	SH

Learning Experience

Year of study: Professional year 3

Hours: 5 (1 + 2 +2)

i. Introductory small group session - 1 hour
ii. Focused small group session - 2 hours
iii. Skills Lab session - 2 hour

Contents:

1. Introductory small group session on the principles of communication with focus on dealing with emotions.
2. Focused small group session with role play or video where students have an opportunity to observe, critique and discuss common mistakes when dealing with emotion.
3. Skills lab sessions where students can perform tasks on standardised or regular patients with opportunity for self critique, critique by patient and by facilitator.

Assessment

1. **Formative:** Participation in session 2 and performance in session 3 may be used as part of formative assessment.

2. **Summative:** may be deferred.

Resources

1. Makoul G. Essential elements of communication in medical encounters: the Kalamazoo consensus statement. Acad Med. 2001; Apr; 76(4): 390-3.

2. Hausberg M. Enhancing medical students' communication skills: development and evaluation of an undergraduate training program. BMC Medical Education 2012; 12:16.

Module 3.2: Case studies in bioethics - Disclosure of medical errors

Background

This introduces the student to further issues in autonomy including full disclosure of mistakes (also see module 2.5).

Competency addressed

The student should be able to:	Level
Demonstrate an understanding of the implications and the appropriate procedure and response to be followed in the event of medical errors	SH

Learning Experience

Year of study: Professional year - 3

Hours: 5

i. Introduction of case – 1 hour
ii. Self-directed learning – 2 hours
iii. Anchoring lecture – 1 hour
iv. Discussion and closure of case – 1 hour

Case: Seeking immunity

It was a busy clinic day and getting worse. Patients were getting impatient. Time was marching and details were becoming a casualty. Five year old Madhumita comes in with her mother. She has asthma and is under your care. You examine her and adjust your prescriptions and start your good byes. At that time, her mother reminds you that she is due for her booster shots. Oh that, you frown - and tell her to wait for a few minutes and that you will have the nurse load the injection and come to the adjoining room and give the injection. You ask the nurse to load the injection and keep it for you over the intercom.

You continue to see patients. After a couple of patients, the mother knocks indicating that she is getting late. You get up and go to the next room. The nurse is not there but you find a loaded syringe. You quickly administer the injection to the child and get back to seeing patients.

A few minutes later, the nurse calls back saying that she has loaded Madhumita's injections. You drop everything and go into the injection room and confront the nurse "But doctor that was gentamicin I had loaded for Mrs. Asif" she says.

Points for discussion:

1. Medical errors in clinical care.
2. The correct approach to disclosure of medical errors.
3. Consequence of failure to disclosure of medical errors including medico-legal, social and loss of trust.

Assessment

1. **Formative:** The student may be assessed based on their active participation in the sessions including role play on disclosure of errors.
2. **Summative:** Short questions on 1) What is the ethical standard in dealing with medical errors?

Module 3.3: The foundations of communication - 4

Background

Communication is a fundamental prerequisite of the medical profession and beside skills is crucial in ensuring professional success for doctors. This module continues to provide an emphasis on effective communication skills. The emphasis is on administering informed consent during professional year III.

Competencies addressed

The student should be able to:	Level
1. Demonstrate ability to communicate to patients in a patient, respectful, non-threatening, non-judgmental and empathetic manner	SH
2. Identify, discuss and defend, medico-legal, socio-cultural and ethical issues as they pertain to consent for surgical procedures	KH
3. Administer informed consent and appropriately address patient queries to a patient undergoing a surgical procedure in a simulated environment	SH

Learning Experience

Year of study: Professional year 3

Hours: 5 (1 + 2 +2)

i. Introductory small group session - 1 hour
ii. Focused small group session - 2 hours
iii. Skills Lab session - 2 hour

Contents:

1. Introductory small group session on the principles of communication with focus on administering informed consent.
2. Focused small group session with role play or video where students have an opportunity to observe, criticise and discuss common mistakes in administering informed consent.
3. Skills lab sessions where students can perform tasks on standardised or regular patients with opportunity for self critique, critique by patient and by facilitator.

Assessment

1. **Formative:** Participation in session 2 and performance in session 3 may be used as part of formative assessment.
2. **Summative:** A skill station in which the student may administer informed consent to a standardized patient.

Resources

1. Makoul G. Essential elements of communication in medical encounters: the Kalamazoo consensus statement. Acad Med. 2001; Apr; 76(4): 390-3.
2. Hausberg M. Enhancing medical students' communication skills: development and evaluation of an undergraduate training program. BMC Medical Education 2012; 12:16.

Module 3.4: Case studies in bioethics - Confidentiality

Background

This introduces the student to confidentiality and its limits (also see module 2.5).

Competency addressed

The student should be able to:	Level
Identify, discuss and defend medico-legal, socio-cultural and ethical issues as it pertains to confidentiality in patient care	KH

Learning Experience

Year of study: Professional year 3

Hours: 5

i. Introduction of case – 1 hour
ii. Self-directed learning – 2 hours
iii. Anchoring lecture – 1 hour
iv. Discussion and closure of case – 1 hour

Case: Do not tell my wife

Ramratan was in tears. “How is it possible doctor? We are expecting our son soon. He will not have a father”. Ramratan had seen you with vague aches, fever, weight loss and cough with expectoration not responsive to antibiotics for the past three months. He had a right mid zone lung shadow on X-ray and the sputum was positive for AFB. On being questioned, he had revealed that he had unprotected sexual intercourse with multiple partners 3 years ago. “But I stopped after I married Danno, doctor - I am faithful to her”. An informed consent was obtained and HIV screening test was ordered and it was positive. A confirmatory test was subsequently obtained and it was also positive. The CDC count was < 100. Ramratan had come to discuss the results of his HIV test. After consoling him and writing out prescriptions for TB and HIV, you mention to him that he must bring his wife for testing. “This is important, Ramratan”, you add - “especially since she is pregnant.”

“Absolutely not, sir!” he explosively retorts. “That is not possible. I will be humiliated. Danno will leave me and go. I will never be able to see my son. I will become

an outcast in our community. I can't live without my wife, doctor. I urge you, doctor - don't do this. I forbid you…"

Points for discussion:

1. The primacy of confidentiality in patient care.
2. What does confidentiality entail?
3. When can confidence be breached with whom and how?
4. Confidentiality and diseases that may engender patients and society.

Assessment

1. **Formative:** The student may be assessed based on their active participation in the sessions.
2. **Summative:** Short questions on 1) What are the instances in which confidentiality of patient information may be breached?

Module 3.5: Case studies in bioethics - Fiduciary duty

Background

This module discusses doctor's duty including fiduciary duty (also see module 2.5)

Competencies addressed

The student should be able to	Level
1. Identify, discuss and defend medico-legal, socio-cultural, professional and ethical issues as it pertains to the physician - patient relationship (including fiduciary duty)	KH
2. Identify and discuss physician's role and responsibility to society and the community that she/ he serves	KH

Learning Experience

Year of study: Professional year 3

Hours: 5

i. Introduction of case – 1 hour
ii. Self-directed learning – 2 hours
iii. Anchoring lecture – 1 hour
iv. Discussion and closure of case – 1 hour

Case: Is he a human being or a machine?

It was a long day and the surgeon has finished four surgeries. Two of these were complicated surgeries requiring all his experience and skills. But it was gratifying. After that he had seen 40 outpatients. He was the most successful doctor in that small community and had provided service for the past 25 years. He had finished his outpatient, ate his meal and went to bed. The night duty doctor who usually comes around 10 pm to sit in the clinic and answer calls from inpatients had taken the night off - he had entrance exams next day. Praying it would be a quiet night he told his wife - I am very very tired; make sure that I am not disturbed.

He woke up at 1AM with the sounds of commotion downstairs. He could hear signs of arguing - Call the doctor, he must come down. He could hear his wife - "please take her to the nearest government hospital. This is a surgical nursing home and doctor is very tired - I cannot wake him up." He could hear irate patient attendants - "but your board

says open 24 hours for emergency. The town hospital is 15 km. away. I don't know if my daughter will make it. By the time the venom will reach the brain. Call your husband now madam. This is not correct". His wife retorted "He has worked from 4AM this morning - he has gone to sleep very tired asking me not to wake him up. Is he the only doctor in town? Is he a human being or a machine? Why are you being unreasonable?" The surgeon reached out for his clothes…

Points for discussion:

1. Duty of a doctor.
2. The concept of fiduciary duty.
3. Balancing personal and professional life.
4. Where to draw the line!

Assessment

1. **Formative:** The student may be assessed based on their active participation in the sessions.
2. **Summative:** Short questions on: What is fiduciary duty?

Learning modules for Professional Year IV

Number of modules: 9

Number of hours: 44

Module 4.1: The foundations of communication - 5

Background

Communication is a fundamental prerequisite of the medical profession and beside skills is crucial in ensuring professional success for doctors. This module continues to provide an emphasis on effective communication skills. During professional year phase III part II (year four), the emphasis is on communicating, diagnosis, prognosis and therapy effectively.

Competencies addressed

The student should be able to:	Level
1. Demonstrate ability to communicate to patients in a patient, respectful, non-threatening, non-judgmental and empathetic manner	SH
2. Communicate diagnostic and therapeutic options to patient and family in a simulated environment	SH

Learning Experience

Year of study: Professional year 4

Hours: 5 (1 + 2 + 2)

i. Introductory small group session - 1 hour
ii. Focused small group session - 2 hours
iii. Skills Lab session - 2 hour

Contents:

This module includes 3 inter-dependent learning sessions:

1. Introductory small group session on the principles of communication with focus on administering communication, of diagnosis, prognosis and therapy.
2. Focused small group session with role play or video where students have an opportunity to observe critique and discuss common mistakes in communicating diagnosis, prognosis and therapy.
3. Skills lab sessions where students can perform tasks on standardised or regular patients with opportunity for self critique, critique by patient and by facilitator.

Assessment

1. **Formative:** Participation in session 2 and performance in session 3 mentioned above may be used as part of formative assessment.
2. **Summative:** A skills station in which the student may communicate a diagnosis management plan and prognosis to a patient.

Resources

Same as Module 3.1

Module 4.2: Case studies in medico-legal and ethical situations

Background

This module discusses the medico-legal and ethical conflicts in adolescents (also see module 2.5).

Competency addressed

The student should be able to:	Level
Identify, discuss and defend medico-legal, socioeconomic and ethical issues as it pertains to abortion / Medical Termination of Pregnancy and reproductive rights	KH

Learning Experience

Year of study: Professional year 4

Hours: 5

i. Introduction of case – 1 hour
ii. Self-directed learning – 2 hours
iii. Anchoring lecture – 1 hour
iv. Discussion and closure of case – 1 hour

Case: The Child's Child

You are the family doctor of Mr. Ravikiran for the past 10 years. One evening toward the end of a busy clinic Mr. Ravikiran, his wife and daughter come in. The usual smiles were absent. There was silence for a few minutes and when you asked what is the matter, Mr. Ravikiran points out to his wife and tells her that you tell him.

Reluctantly and with tears bursting in her eyes she tells you that her only daughter Sapna who is 16 years old had amenorrhea for 4 months. She had taken her to the gynecologist, who after examining her ordered an ultrasound scan of the abdomen which showed a 16 week fetus. After much argument and discussion, the family requested the gynecologist to perform a Medical Termination of Pregnancy (MTP). Sapna, however refuses to undergo an MTP - claiming that the child is her expression of love and that she believes that taking away her baby's life will be tantamount to murder.

The parents are embarrassed to face society and feel that continuing the pregnancy will harm the daughter. As parents, they feel that they have a right to determine if their daughter should undergo a Medical Termination of Pregnancy or not. The daughter feels that she is old enough. As their family doctor, they would like you to help them through this nightmare.

Points for discussion:

1. Who makes health care decisions for adolescents?
2. What are the medical implication of the MTP act?
3. Are there provisions for emancipated minors?
4. Should adolescents be included in the decision making process?

Assessment

1. **Formative:** The student may be assessed based on their active participation in the sessions.
2. **Summative:** Short questions on the Medical Termination of Pregnancy Act

Module 4.3: Case studies in medico-legal and ethical situations

Background

This module discusses the medico-legal and ethical conflicts in organ transplantation (also see module 2.5).

Competency addressed

The student should be able to:	Level
Identify and discuss medico-legal, socio-economic and ethical issues as it pertains to organ donation	KH

Learning Experience

Year of study: Professional year 4

Hours: 5

i. Introduction of case – 1 hour
ii. Self-directed learning – 2 hours
iii. Anchoring lecture – 1 hour
iv. Discussion and closure of case – 1 hour

Case: The angry brick kiln owner

68 year old Muthukumar is your patient for the past 8 years. You are his family doctor and he seldom does anything without consulting you first. A self made man with no formal education he is a successful brick kiln owner in the suburbs of the city. He has hypertension and diabetes even before the time he has been under your care. Today he enters your office distraught and angry and unable to speak. You calm him down…

Muthukumar is a known diabetic and hypertensive for the past 23 years and has been on multiple medications in the past. Six years ago, he was diagnosed with chronic renal failure. For the past one year, his renal function has been worsening. The nephrologist that you had recommended had suggested dialysis and he has been on hemodialysis thrice a week for the past 6 months. At the last visit, he was suggested renal transplantation.

Muthukumar continues “I saw that kidney doctor today, Doctor. He said that I can get a new kidney instead of my old one. He told me that I need someone to donate a kidney to me. I told him that I don't need anyone’s charity and I can buy one donor. That doctor laughed at me, sir - he told me that I cannot buy any kidney and that one of my relatives must donate it to me - He even said that my younger brother is probably the best person to donate the kidney. How dare he, Sir - my younger brother who is dearer to me than a son. I have so many employees in my factory who will line up to give me a kidney. Why is this doctor talking like this?

Points for discussion:

1. Can a kidney be bought?
2. What are the health economic outcomes of selling a kidney?
3. What are the medico-legal and ethical implications of the Human Organ Transplantation Act?

Assessment

1. **Formative:** The student may be assessed based on their active participation in the sessions.
2. **Summative:** Short questions on the Human Organ Transplantation Act.

Module 4.4: Case studies in ethics empathy and the doctor-patient relationship

Background

This module discusses some nuances in the doctor-patient relationship including - failure of therapy, termination of relationships etc. (also see module 2.5).

Competencies addressed

The student should be able to:	Level
1. Demonstrate empathy in patient encounters	SH
2. Communicate care options to patient and family with a terminal illness in a simulated environment	SH

Learning Experience

Year of study: Professional year 4

Hours: 5

i. Introduction of case – 1 hour
ii. Self-directed learning – 2 hours
iii. Anchoring lecture – 1 hour
iv. Discussion and closure of case – 1 hour

Case: A letter from the grave

Respected doctor:

I am writing this letter with extreme sadness. As you may know that it has been three months since my wife and your patient Mrs. Alka Chaturvedi has passed away. I am writing this letter not with anger or with spite; I am writing this only with the intent that my wife's death not be in vain and that the lessons that can be learned from the way you took care of her may be valuable to other patients in your care and that they will receive the compassion and care from you that Alka never received.

As you may recall, Alka was diagnosed with breast cancer 5 years ago. We rushed to you knowing your reputation as a talented oncologist and we were not disappointed. Your aggressive approach to the disease made all the difference. Surgery and aggressive chemotherapy, while distressing, helped Alka beat the disease and she lived disease-free for 2 years. We were very happy and were and still are very grateful to you. But fate had

ordained that our joy will be short-lived. The disease came back with a vengeance. Even at this time you did not give up hope and took on the disease like a warrior but then there came a time that it was clear that the disease had won. We were devastated.

Alka looked up to you as a doctor to provide her with support but it looked like that you were unable to confront the failure. While you did prescribe pain medications and your office helped us find a home nurse you were reluctant to meet Alka or talk to her. When we called for appointments, your office would tell us to contact our family doctor for pain medications. When we did get to see you would not even look at Alka's eyes. You would distractedly talk to her, refill her pain medications and dismiss us quickly. It was as if we were seeing a different doctor than the one we had seen when all was well. And when Alka was admitted to the hospital where she breathed her last you would not even come and see her. We made so many requests for you to come and visit with her. I even called and told you that it would mean so much for her to see you before she departs but you did not.

Would it have been too much for you to come and hold her hand for a minute or say a kind word? Doctor - I am not as learned as you are but patients come to you and repose their faith in you to help them through their illness. We come to you not with the expectation that a cure is always possible but always with the expectation that you will support us in coping with the disease and the tremendous effects it has on our lives. We don't always expect you to succeed but we always expect you to show us care and compassion. I hate to point to out, doctor, that you abandoned Alka when it was clear that she will not be a trophy that you can parade as a success. You abandoned Alka and us at the time we needed you most. You sir, abandoned us when we were most vulnerable.

I write this to you not to fault your knowledge and skills which are considerable. I bear you no ill will. I am grateful that you gave Alka and our family a few more years of togetherness. I only write to remind you that knowledge and skills are not sufficient for a doctor. Compassion, empathy and non-abandonment are superior virtues. I can only hope that Alka's experience with you will help you take care of your other patients who may not all be successes, as you seem to define it. If only you provided patients empathy, all your patients will be your successes, irrespective of outcome.

Sincerely

Points for discussion:

1. The role of a doctor as a healer.
2. Failure of treatment and its implications for the doctor-patient relationship.
3. Empathy and patient care.
4. Can the doctor-patient relationship be terminated?
5. Hospice care.

Assessment

1. **Formative:** The student may be assessed based on their active participation in the sessions.
2. **Summative:** Short questions on 1) Empathy 2) Doctor's responsibilities in the doctor-patient relationship 3) Doctor's responsibilities in the care of the terminally ill patient.

Module 4.5: Case studies in ethics: the doctor-industry relationship

Background

This module discusses some nuances in the doctor-industry relationship (also see module 2.5).

Competency addressed

The student should be able to:	Level
Identify and discuss and defend medico-legal, socio-cultural, professional and ethical issues in physician - industry relationships	KH

Learning Experience

Year of study: Professional year 4

Hours: 5

i. Introduction of case – 1 hour
ii. Self-directed learning – 2 hours
iii. Anchoring lecture – 1 hour
iv. Discussion and closure of case – 1 hour

Case: The Launch

It was the end of the morning session in your clinic. You were getting ready to have lunch when you are told that a drug company representative wants to meet you. You let him in and he tells you. “Sir - we are launching a new combination drug next month. We are planning a one hour meeting to introduce you to the product. The meeting will be held in Singapore and we will fly you and your spouse business class. All expenses will be borne by us. You can stay there for 3 days, sir. The meeting will be held in a cruise ship. The meeting will be only for one hour, sir. After that there will be a gala dinner and entertainment, Sir. Also, to compensate you for losing your practice for those three days we will pay you an honorarium of Rs. 25000 for each day that you are there. This is our way of saying thank you for all the support in the past and the support that you are going to provide in making this new molecule a success.”

Points for discussion:

1. The influence of pharmaceutical industry on doctor's prescription behavior.
2. The limits of doctor - industry engagement.

Assessment

1. **Formative:** The student may be assessed based on their active participation in the sessions.
2. **Summative:** Short questions on 1) Can doctors accept gifts from pharmaceutical industry? Explain your choice.

Resources

The MCI &AMA Code of Medical Ethics.

Module 4.6: Case studies in ethics and the doctor - industry relationship

Background

This module discusses some nuances in the professional relationships and conflicts there of (also see module 2.5).

Competency addressed

The student should be able to:	Level
Identify conflicts of interest in patient care and professional relationships and describe the correct response to these conflicts	SH

Learning Experience

Year of study: Professional year 4

Hours: 5

i. Introduction of case – 1 hour
ii. Self-directed learning – 2 hours
iii. Anchoring lecture – 1 hour
iv. Discussion and closure of case – 1 hour

Case: The Offer

You get a call from the secretary of the promoter of the largest and most successful corporate hospital in the city asking for an appointment for you with him. You are perplexed but make it to the appointment. You enter a large well appointed room. The owner of the hospital gets up from his chair, welcomes you and asks you to sit down.

"Welcome to our hospital, doctor." After a few minutes of empty banter, he says – "My marketing executives tell me that you are the most successful practitioner in this area. As you know, we are a growing organisation; we are eager to partner with you. Doctor, I know that you use the services of another hospital here but we can make it worth your while to consider". You look enquiringly. He continues. "In addition to your professional charges that you can determine, we can provide you with 20% of the hospital's collections from your patient including radiology and laboratory charges. If you send us your

outpatients for consultations, laboratory or radiology we will give you back 30% of our collections. We hope that you will consider this, doctor and become part of our extended family."

Points for discussion:

1. Fee splitting and other practices.
2. Can doctors become entrepreneurs?
3. Can doctors own pharmacies or hold stock in pharmaceutical companies?
4. What comprises professional conflict of interest?

Assessment

1. **Formative:** The student may be assessed based on their active participation in the sessions.
2. **Summative:** Short questions on: 1) Fee splitting and its implications for patient care,
   2) Conflicts in professional relationships.

Module 4.7: Case studies in ethics and patient autonomy

Background

This module discusses ethical issues in care of children (also see module 2.5).

Competency addressed

The student should be able to:	Level
Identify conflicts of interest in patient care and professional relationships and describe the correct response to these conflicts	SH

Learning Experience

Year of study: Professional year 4

Hours: 5

i. Introduction of case – 1 hour
ii. Self-directed learning – 2 hours
iii. Anchoring lecture – 1 hour
iv. Discussion and closure of case – 1 hour

Case: The "Cruel" Parents

A six year old boy is brought to the emergency room with a single episode of generalised tonic clonic convulsions. The child is stabilised on IV anti-epileptics and an oral anti-epileptic is started. There are no further episodes during the hospitalisation. The child is scheduled for an EEG and an MRI. Through this time the family had been cooperative with the treatment. The parents appear to be educated and appeared to care for their son deeply. When further investigations are suggested, the parents come back to you and say - "doctor, thank you for helping us at a time of need but we feel that it is against our faith to continue allopathic care. We have decided to go back to our ancestral village and our family shrine where we have scheduled a ritual tomorrow. Our priest has promised us that the child will be disease-free, if we perform the rites required. This convulsion is a result of the curse of our ancestors and if we do the requisite rituals to please them the

child will be cured of the disease. Please do not do anymore tests or treatments. We are stopping the medications tomorrow and will get discharged. Thank you."

Points for discussion:

1. Who has the right to decide for children?
2. Can parents refuse treatment even in life threatening situations?
3. What if there is a conflict?

Assessment

1. **Formative:** The student may be assessed based on their active participation in the sessions.
2. **Summative:** Short questions on parental consent.

Module 4.8: Dealing with death

Background

Thanatology is a branch of science that deals with death. Death is an event that any medical student will inevitably face during the course of their professional career. Dealing with death empathetically and at the same time not being overwhelmed by it is an important coping skill for doctors.

Competencies addressed

The student should be able to:	Level
1. Identify conflicts of interest in patient care and professional relationships and describe the correct response to these conflicts.	SH
2. Demonstrate empathy to patient and family with a terminal illness in a simulated environment.	SH

Learning Experience

Year of study: Professional year 4

Hours: 5

i. Introduction of case – 1 hour
ii. Self-directed learning – 2 hours
iii. Anchoring lecture – 1 hour
iv. Discussion and closure of case – 1 hour

Case: The Empty Bed

You are a house surgeon in the night shift of the ICU. A 19 year old girl Sharmila is wheeled into the ICU. She has a complicated history. She had surgery for cyanotic congenital heart disease at age 8. She has a history of severe asthma often requiring admission for steroids. She lives in a home near a construction site and recently the attacks have flared up. She now has frequent admissions for asthma exacerbations. She is now constantly on steroids. In the last month, she has had 3 admissions. But she fights it bravely. She carries her books with her when she comes in and after the attack settles down she sits quietly reading. Despite the struggle you noticed that the staff nurses liked her. She was positive and charming. Today was no different but the attack seemed worse.

In the ER, the FEV1 was horrible. They had pumped her with steroids, put her on continuous nebulization, an aminophylline infusion was in place when you received her. The smile was smaller but there. The face was cushingoid with all the steroids and the body looked tired. She was moved to her usual bed number 9. Your shift was getting over at 7 a.m. but you stayed on an hour. She looked better, the smile was back you reassured her and said I'll be back in the evening and left.

That evening you report for duty and as you look through the patients, bed number 9 is empty. "Have you discharged Sharmila?" you asked the nurse. No doctor – she developed a sudden cardiac arrest at 12 noon – we could not revive her.

Points for discussion:

1. How should doctors deal with the emotions of patients and family facing death?
2. What does the patient experience when he/she is dying? Can physicians make the process of death comfortable?
3. What are the emotions faced by doctors when confronting death in patients? Is death a defeat for the doctor? Should the doctor be emotionally detached from a dying patient?
4. What are the cultural aspects of dying?

Alternate Case: I have decided to die

You are a physician in a community care practice for over 20 years and caring for various patients. Mr. Bhaskara Rao is a patient in your care for the past 14 years. He is 76 years old and has diabetes for the past 30 years. He had renal failure for the past 10 years and is CKD stage V requiring dialysis for 3 years. While he is following up with the nephrologist he values your position in his family as a family doctor and regularly visits you to check if his treatment is correct and more often to seek reassurance. He has invited you to all his family events – the last being one month ago for his grandson's wedding.

This morning you get a call from him. "Doctor! He says in his usual cheerful voice. Can I meet you tomorrow? I have fulfilled all my responsibilities in life. I am not sad. My children are all settled; my grandson is married; my wife as you know is no more. I have decided to stop my dialysis and say goodbye to this world. I thought I'll talk to you about how to prepare for my death!"

Learning Experience

Year of study: Professional year 4

Hours: 5

i. Introduction of case – 1 hour
ii. Self-directed learning – 2 hours
iii. Anchoring lecture – 1 hour
iv. Discussion and closure of case – 1 hour

Points for discussion:

1. Can patients choose to die? Is there a role for doctors in the death of patients? Can doctors assist death?
2. How should doctors deal with the emotions of patients and family facing death?
3. What does the patient experience when he/she is dying? Can physicians make the process of death comfortable?
4. What are the emotions faced by doctors when confronting death in patients? Is death a defeat for the doctor? Should the doctor be emotionally detached from a dying patient?
5. What are the cultural aspects of dying?

Assessment

1. **Formative:** Participation in sessions may be used as part of formative assessment. Submitted narrative on the socio cultural aspects of death may be used as assessment**.**
2. **Summative:** Short question on assisted dying.

Module 4.9: Medical Negligence

Background

This introductory session allows students to be familiar with the legal aspects of care including negligence and malpractice and ways to protect themselves from such issues.

Competencies addressed

The student should be able to:	Level
1. Identify, discuss and defend medico-legal, socio-cultural, professional and ethical issues pertaining to medical negligence	KH
2. Identify, discuss and defend medico-legal, socio-cultural, professional and ethical issues pertaining to malpractice	KH

Learning Experience

Year of study: Professional year 4

Hours: 4

i. Introduction of case – 1 hour
ii. Self-directed learning – 2 hours
iii. Discussion and closure of case – 1 hour

Learning Method

This is an interactive panel discussion by students with legal experts and senior members of the medical profession. A written summary of learning may be provided by the student based on the learning.

Assessment

1. **Formative:** Submitted summary may be used as assessment.
2. **Summative:** Short question on medical negligence

Section III

Competency Acquisition: Suggested Log Book pattern

Name of student	Roll number	Year of joining
Specific competency no.		
Competency required to graduate	Universal competency no.	
Administer informed consent to a patient undergoing surgery in a simulated environment (Dreyfus level advanced beginner)		
Competency must be acquired at the end of professional year	IV	
Is the acquisition of this competency a prerequisite to advancement to the next phase	Yes/ No	
Does this competency require performance in a patient	Yes/ No	
Number of times the student must have performed the skill		
	Date Completed	**Supervisor**
Certified by Faculty: Name, Date and UID		
Student's descriptive narrative of skill acquired		
Faculty only: If the student has not completed the competency, write down the reasons and remedial measures suggested		

Section IV

Formative Elements to be marked by Tutor

(Desirable competencies in attitude, ethics and communication skills that may be included in whole or part of the formative assessment of the student)

	Competency	**PY1**	**PY2**	**PY3**	**PY4**
	Indicate as appropriate to the level of training DME: Does not meet expectations; ME - Meets Expectations; N/A: Not applicable				
1.	demonstrate ability to work in a team of peers and superiors				
2.	demonstrates respect to patient privacy				
3.	demonstrate ability to maintain confidentiality in patient care				
4.	demonstrate a commitment to continued learning				
5.	demonstrate responsibility and work ethics while working in the health care team				
6.	demonstrate respect in relationship with patients, fellow team members, superiors and other health care workers				
7.	demonstrates ability to maintain required documentation in health care (including correct use of medical records)				
8.	demonstrates personal grooming that is adequate and appropriate for health care responsibilities				
9.	demonstrates adequate knowledge and use of information technology that permits appropriate patient care and continued learning				
10.	demonstrates respect and follows the correct procedure when handling cadavers and other biologic tissues				
11.	demonstrates awareness of limitations and seeks help and consultations appropriately				
12.	demonstrates appropriate respect to colleagues in the profession				
	Feedback provided to student (Y/N)				
	Signed by Mentor/tutor Name: Faculty ID	Initial/ Date	Initial/ Date	Initial/ Date	Initial/ Date

Appendix 1

List of competencies in Attitude, Ethics and Communication

Note: Competencies from 1 - 39 are core competencies. Competencies 40 -54 are non-core (desirable) competencies that be assessed formatively

No	COMPETENCY The student should be able to:	Domain	K/KH/ SH/P
1	Enumerate and describe professional qualities and roles of a physician	K	KH
2	Describe and discuss the commitment to lifelong learning as an important part of physician growth	K	KH
3	Describe and discuss the role of non-malfeasance as a guiding principle in patient care	K	KH
4	Describe and discuss the role of autonomy and shared responsibility as a guiding principle in patient care	K	KH
5	Describe and discuss the role of beneficence of a guiding principle in patient care	K	KH
6	Describe and discuss the role of a physician in health care system	K	KH
7	Describe and discuss the role of justice as a guiding principle in patient care	K	KH
8	Identify and discuss medico-legal, socioeconomic and ethical issues as it pertains to organ donation	K	KH
9	Identify and discuss and defend medico-legal, socioeconomic and ethical issues as it pertains to abortion / medical termination of pregnancy and reproductive rights	K	KH
10	Identify, discuss and defend medico-legal, socio-cultural economic and ethical issues as it pertains to rights, equity and justice in access to health care	K	KH

No	COMPETENCY The student should be able to:	Domain	K/KH/ SH/P
11	Identify, discuss and defend medico-legal, socio-cultural and ethical issues as it pertains to confidentiality in patient care	K	KH
12	Identify, discuss and defend medico-legal, socio-cultural and ethical issues as it pertains to patient autonomy, patient rights and shared responsibility in health care	K	KH
13	Identify, discuss and defend medico-legal, socio-cultural and ethical issues as it pertains to decision making in health care including advanced directives and surrogate decision making	K	KH
14	Identify, discuss and defend medico-legal, socio-cultural and ethical issues as it pertains to decision making in emergency care including situations where patients do not have the capability or capacity to give consent	K	KH
15	Identify, discuss and defend medico-legal, socio-cultural and ethical issues as it pertains to research in human subjects	K	KH
16	Identify, discuss and defend medico-legal, socio-cultural and ethical issues as they pertain to health care in children (including parental right to refuse treatment)	K	KH
17	Identify, discuss and defend medico-legal, socio-cultural and ethical issues as they pertain to health care in children including parental rights	K	KH
18	Identify, discuss and defend, medico-legal, socio-cultural and ethical issues as they pertain to consent for surgical procedures	K	KH
19	Identify, discuss and defend medico-legal, socio-cultural, professional and ethical issues as it pertains to the physician patient relationship (including fiduciary duty)	K	KH

No	COMPETENCY The student should be able to:	Domain	K/KH/ SH/P
20	Identify and discuss physician's role and responsibility to society and the community that she/ he serves	K	KH
21	Identify, discuss and defend medico-legal, socio-cultural, professional and ethical issues in physician industry relationships	K	KH
22	Demonstrate ability to work in a team of peers and superiors	S	SH
23	Demonstrate ability to communicate to patients in a patient, respectful, non-threatening, non-judgemental and empathetic manner	S	SH
24	Demonstrate respect to patient privacy	S	SH
25	Demonstrate ability to maintain confidentiality in patient care	S	SH
26	Demonstrate a commitment to continued learning	S	SH
27	Demonstrate respect in relationship with patients, fellow team members, superiors and other health care workers	S	SH
28	Demonstrate responsibility and work ethics while working in the health care team	S	SH
29	Demonstrate ability to maintain required documentation in health care (including correct use of medical records)	S	SH
30	Demonstrate personal grooming that is adequate and appropriate for health care responsibilities	S	SH
31	Demonstrate adequate knowledge and use of information technology that permits appropriate patient care and continued learning	S	SH

No	COMPETENCY The student should be able to:	Domain	K/KH/ SH/P
32	Demonstrate respect and follows the correct procedure when handling cadavers and other biologic tissues	S	SH
33	Administer informed consent and appropriately address patient queries to a patient undergoing a surgical procedure in a simulated environment	S	SH
34	Communicate diagnostic and therapeutic options to patient and family in a simulated environment	S	SH
35	Communicate care options to patient and family with a terminal illness in a simulated environment	S	SH
36	Demonstrate awareness of limitations and seeks help and consultations appropriately	S	SH
37	Demonstrate appropriate respect to colleagues in the profession	S	SH
38	Demonstrate an understanding of the implications and the appropriate procedure and response to be followed in the event of medical errors	S	SH
39	Identify conflicts of interest in patient care and professional relationships and describes the correct response to these conflicts	S	SH
40	Demonstrate empathy in patient encounters	S	SH
41	Demonstrate ability to balance personal professional priorities	S	SH
42	Demonstrate ability to manage time appropriately	S	SH
43	Demonstrate ability to form and function in appropriate professional networks	S	SH

No	COMPETENCY The student should be able to:	Domain	K/KH/ SH/P
44	Demonstrate ability to pursue and seek career advancement	S	SH
45	Demonstrate ability to follow risk management and medical error reduction practices where appropriate	S	SH
46	Demonstrate ability to work in a mentoring relationship with junior colleagues	S	SH
47	Demonstrate commitment to learning and scholarship	S	SH
48	Identify, discuss and defend medico-legal, socio-cultural, economic and ethical issues as they pertain to in vitro fertilisation donor insemination and surrogate motherhood	K	KH
49	Identify, discuss and defend medico-legal, socio-cultural professional and ethical issues pertaining to medical negligence	K	KH
50	Identify, discuss and defend medico-legal, socio-cultural professional and ethical issues pertaining to malpractice	K	KH
51	Identify, discuss and defend medico-legal, socio-cultural professional and ethical issues in dealing with impaired physicians	K	KH
52	Identify, discuss and defend medico-legal, socio-cultural and ethical issues as they pertain to refusal of care including do not resuscitate and withdrawal of life support	K	KH
53	Demonstrate altruism	S	SH
54	Administer informed consent and appropriately address patient queries to a patient being enrolled in a research protocol in a simulated environment	S	SH

Additional list of desirable competencies in attitude, ethics and communication but listed as non-core

Competency	Domain	Level
Identify, discuss, and defend medico-legal, socio-cultural and ethical issues as they pertain to refusal of care including do not resuscitate and withdrawal of life support	K	KH
Identify, discuss and defend medico-legal, socio-cultural, professional and ethical issues in dealing with impaired doctors	K	KH
Demonstrate altruism	S	KH
Administer informed consent and appropriately addresses patient queries to a patient being enrolled in a research protocol in a simulated environment	S	KH
Demonstrate appropriate respect to colleagues in the profession	S	SH
Identify, discuss and defend medico-legal, socio-cultural, professional and ethical issues pertaining to medical negligence	K	KH
Identify, discuss and defend medico-legal, socio-cultural, professional and ethical issues pertaining to malpractice	K	KH
Demonstrate ability to balance personal professional priorities	S	SH
Demonstrate ability to manage time appropriately	S	SH
Demonstrate ability to form and function in appropriate professional networks	S	SH
Demonstrate ability to pursue and seek career advancement	S	SH
Demonstrate ability to follow risk management and medical error reduction practices where appropriate	S	SH
Demonstrate ability to work in a mentoring relationship with junior colleagues	S	SH

Competency	Domain	Level
Demonstrate commitment to learning and scholarship	S	SH

Appendix 2

Communication skills rating scale adapted from Kalamazoo consensus statement

Rating 1-3 - Poor, 4 -6 Satisfactory, 6 -10 Superior

Criteria	Score
Builds relationship	
Opens the discussion	
Gathers information	
Understands the patient's perspective	
Shares information	
Manages flow	
Overall rating	

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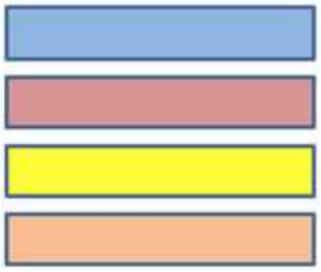
COMPETENCY BASED UNDERGRADUATE CURRICULUM
FOR THE INDIAN MEDICAL GRADUATE

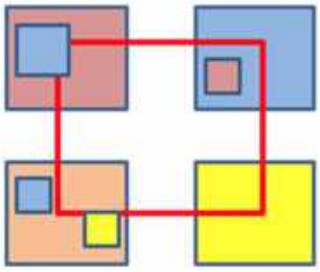
Knows Knows how Shows Shows how Performs

Describe Observe Demonstrate
Enumerate Assist

Counsel Prescribe

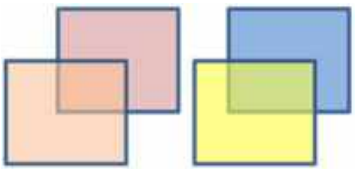


Analyse

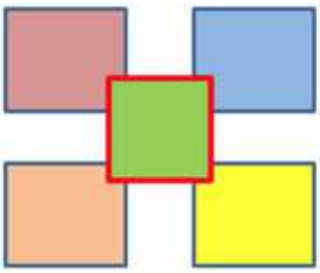


Integrate

Guide Communicate



Correlate



Interpret

Critique Collaborate

Module 4

Alignment and Integration

Clinician Communicator Team Leader Professional Lifelong Learner

Knowledge | Skills | Attitude | Values | Responsiveness | Communication

Curriculum Implementation Support Program

Alignment and Integration

Module for

Undergraduate Medical Education

Program

2019

Medical Council of India

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Foreword

Alignment and Integration

Subject based education has tremendous advantages. It provides learners with the opportunity to dwell deep into the learning matter and acquire strong fundamental concepts and the ability to build on it and attain scholarship. However, the unique needs of medical education necessitate both an understanding of "interconnectedness" between subjects and their ultimate application to the patient. In an attempt to address the need for enhancing the "wholesomeness" of education in the competency based curriculum while retaining the inherent strength and flavour of subject-based instruction, the Expert Group has recommended the use of two strategies: (a) alignment of related subject matter in a temporally coordinated fashion, and (b) use of three integration concepts that will enhance prior recall, application and emphasis of interconnectedness namely **sharing, nesting and correlation.**

This is a novel and challenging approach that has been suggested to further the goal of the competency driven curriculum that will require considerable planning, collaboration and team work amongst learners, teachers, planners and administrators in institutions. We believe that this investment is necessary to prepare learners to confront, adapt and be successful in the challenging environment of medical care. In addition to meeting the needs outlined, this approach will foster self - directed learning, team work, collaboration and inquiry. Importantly, the patient centricity that this approach will bring into the curriculum from year one will ensure that learners always have a connect with the ultimate goal of the MBBS program.

This booklet is intended to help institutions and teachers to design curriculum incorporating the approach suggested by the Expert Group. It is richly illustrated with examples on how to create an aligned and integrated timetable. We hope that this will be a useful guide.

We are grateful to the members of the Expert Group and the Academic Cell for painstakingly putting this booklet together. We hope that teachers and institutions will benefit from the suggestions provided herein and can successfully adapt and apply them into their own environment. We aspire to learn more and share with the nation the best practices that abound in all the medical colleges across the country. The ultimate aim of this exercise is to create a generation of doctors who will provide standard health care to the nation while becoming excellent scientists and scholars.

Chairman, Board of Governors

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Foreword

Alignment and Integration

This booklet provides a suggested pattern for alignment and integration of related competencies encapsulated in different subjects for teaching competency based MBBS program which commenced on August 1, 2019 across the country. Alignment of related topics to the extent feasible is a major thrust of the competency based curriculum. The Regulations in Graduate Medical Education 2019 (GMER 2019) also suggests integration to the extent of 20% of the subject-based curriculum through horizontal and vertical integration. This booklet is in alignment with the GMER 2019 part II document and provides institutions and curriculum planners a step by step approach to create a timetable for teaching, incorporating the principles of alignment and integration.

This booklet has been developed by experts invited by the Board of Governors in supersession of the Medical Council of India and incorporates their vast expertise and experience. The Council acknowledges their time and effort dedicated in creating this guide that can be used by institutions to develop their own learning process and content. Appreciation is also due to the efforts of the Academic Cell of the Council and faculty at the various Regional and Nodal Centres of MCI who worked tirelessly to ensure that the new competency driven curriculum and its various unique components are implemented faithfully and flawlessly across the medical colleges in this country from August 2019.

Vats

(Dr. R.K. Vats)
Secretary General

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Curriculum Implementation Support Program

Module – 4

ALIGNMENT AND INTEGRATION

Alignment and Integration

Introduction

The purpose of the MBBS program is to facilitate the medical student to become a primary caregiver to patients. Learning in the various basic and clinical science subjects is predominantly directed towards achieving this purpose. The volume and details required by the student to master each subject that comprises the overall MBBS program is considerable. Subject based instruction provides an opportunity for the student to acquire both vast and deep knowledge of each subject. This structure of instruction, however, may lead to lack of appreciation by the student of the inter-connected nature of knowledge in the various subjects, their relatedness, and importantly their relevance to patient care. Additionally study in silos alone may lead to redundancy in instruction.

Several innovative methods have been developed over the years to address these challenges including various levels of integration of instruction that diminishes and removes boundaries within subjects both horizontally in a phase and vertically across phases. While appreciating the value of these approaches, the proposed Graduate Medical Education Regulations (GMER) 2019 has sought to strike a balance that will retain the strength of traditional subject-based teaching and the reality of subject based assessment while providing the relevance, opportunity to understand the interconnectedness and reduce redundancy in the subjects being taught.

In order to achieve this, the MBBS curriculum will become a) aligned to the extent possible - meaning that as much as possible topics in different subjects in the same phase that have similar threads will be grouped together in the timetable and b) integrated to a limited extent both vertically and horizontally. The purpose of horizontal integration (within a phase) is to remove redundancy and provide interconnectedness. In the earlier phases, the purpose of vertical integration (across phases) is to emphasise the applicative use of the basic science concept taught. In the later phases, its purpose is to utilise and build on prior knowledge and emphasise the foundations of clinical practice.

This document is meant to guide institutions, Curriculum Committee, MEU members, and teachers on how to create a timetable that incorporates the principles that have been laid down above reflecting the spirit of the proposed GMER document 2019.

Objective

The participant must be able to:

Facilitate the development of an aligned and integrated curriculum in his/her institution as envisaged in the GMER 2019 document.

Glossary of terms used

For the purposes of this document -

Alignment implies the teaching of subject material that occurs under a particular organ system/disease concept from the same phase in the same time frame i.e., temporally.

Integration implies that concepts in a topic / organ system that are similar, overlapping or redundant are merged into a single teaching session in which subject based demarcations are removed. For the purpose of this document, topics from other phases that are brought into a particular phase for the purpose of reinforcement or introduction will also be considered as integrated topics. In the GMER 2019, time for integrated teaching is clearly demarcated.

Linker is a session that allows the learner to link the concepts presented in an aligned and integrated topic.

Curricular element or Program addressed

Alignment and Integration

Relevant Extracts from GMER 2019

10.1 Preamble: The salient feature of the revision of the medical curriculum in 2019 is the emphasis on learning which is competency-based, integrated and student-centered acquisition of skills and ethical & humanistic values.

Each of the competencies described below must be read in conjunction with the goals of the medical education as listed in items 2 and 3 of the GMER.

It is recommended that didactic teaching be restricted to less than one third of the total time allotted for that discipline. Greater emphasis is to be laid on hands-on training, symposia, seminars, small group discussions, problem-oriented and problem-based discussions and self-directed learning. Students must be encouraged to take active part in and shared responsibility for their learning.

10.2 Integration must be horizontal (i.e. across disciplines in a given phase of the course) and vertical (across different phases of the course). As far as possible, it is desirable that teaching/learning occurs in each phase through study of organ systems or disease blocks in order to align the learning process. Clinical cases must be used to integrate and link learning across disciplines.

Subject specific competencies with appropriate alignment and integration are available in the new competency based UG Curriculum document uploaded in the Medical Council of India website.

Description of the curricular program

Alignment

Teaching related systems or topics from different subjects in the same phase is strongly recommended. This is the principal method to be followed while creating the phase-wise timetable or calendar and is called alignment (see figure 1).

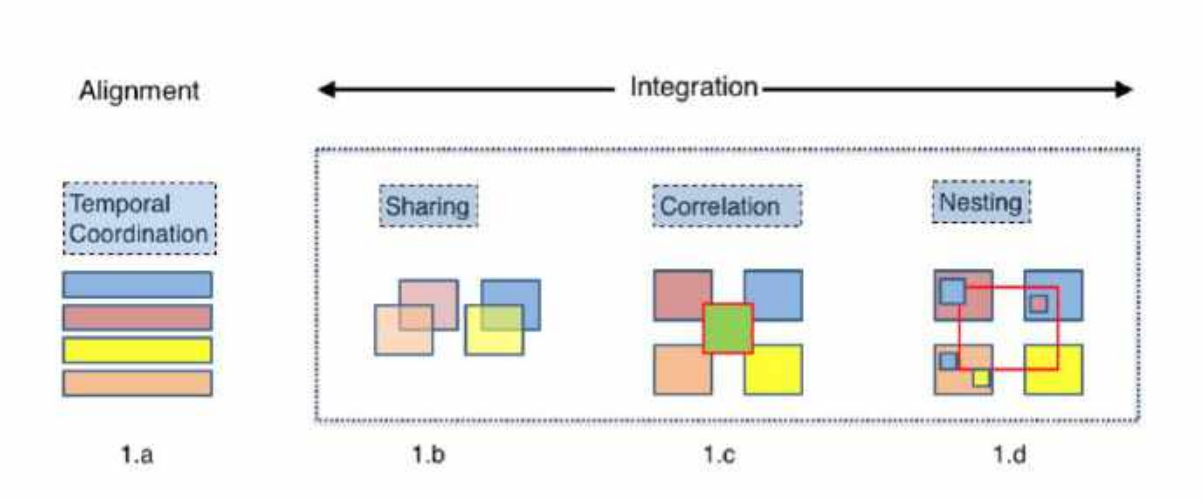


Figure 1: Integration concepts framed in the GMER 2019. Coloured boxes represent subjects. **1a. Alignment** - Temporal coordination: The timetable is adjusted so that topics within the subjects or disciplines which are related, are scheduled at the same time. **1b. Sharing**: Two disciplines may agree to plan and jointly implement a teaching program. **1c. Correlation**: The emphasis remains on disciplines or subjects with subject-based courses taking up most of the curriculum time. Within this framework, an integrated teaching session or course is introduced in addition to the subject-based teaching (green box with red border). **1d. Nesting:** the teacher targets, within a subject-based course, skills relating to other subjects *(Adapted from Harden R Med Edu 2000. 34; 551).*

Alignment is recommended for the majority of the curriculum allowing similar systems or topics in different subjects to be learnt separately but during the same time frame.

Aligning could be done as organ system based (figure 2a) or topic/disease based (figure 2b) or both (figure 2c)

Example: Syllabi in Cardiovascular system or Respiratory system in anatomy, physiology and biochemistry can be scheduled simultaneously in the timetable (figure 2a).

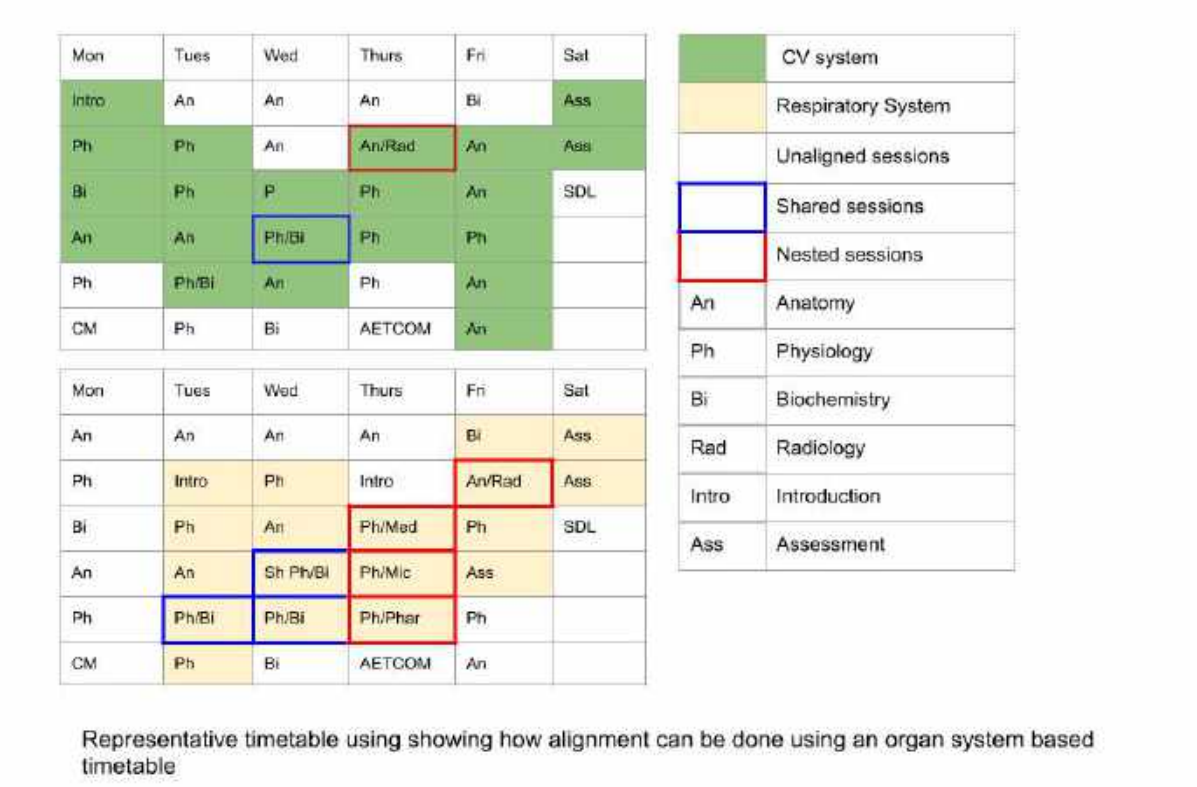
Example: A topic such as acute myocardial infarction or Tuberculosis can be created with the relevant learnings that will lead to the understanding of these topics

If desired, the major alignment can be organ system based with incorporation of some specific topics that will lend itself to integration (see below).

For eg. – In CV organ system the major alignment is with two topics, Acute Myocardial Infarction and Heart failure.

These topics or organ systems that are going to be aligned should be identified by the Curriculum Committee of the teaching institution and must be taught in an aligned fashion in each phase.

The method to derive topic objectives and sessions from competencies is outlined further in this booklet.



Mon	Tues	Wed	Thurs	Fri	Sat
Intro	An	An	An	Bi	Ass
Ph	Ph	An	An/Rad	An	Ass
Bi	Ph	P	Ph	An	SDL
An	An	Ph/Bi	Ph	Ph	
Ph	Ph/Bi	An	Ph	An	
CM	Ph	Bi	AETCOM	An	

Mon	Tues	Wed	Thurs	Fri	Sat
An	An	An	An	Bi	Ass
Ph	Intro	Ph	Intro	An/Rad	Ass
Bi	Ph	An	Ph/Med	Ph	SDL
An	An	Sh Ph/Bi	Ph/Mic	Ass	
Ph	Ph/Bi	Ph/Bi	Ph/Phar	Ph	
CM	Ph	Bi	AETCOM	An	

	CV system
	Respiratory System
	Unaligned sessions
	Shared sessions
	Nested sessions
An	Anatomy
Ph	Physiology
Bi	Biochemistry
Rad	Radiology
Intro	Introduction
Ass	Assessment

Representative timetable using showing how alignment can be done using an organ system based timetable

Figure 2a: Creating an aligned timetable using organ systems (six hours per day basis)

Mon	Tues	Wed	Thurs	Fri	Sat
An	An	An	An	Bi	Ass
Ph	Intro	An	An/Rad	An	Ass
Bi	Ph	PhBi	Ph/Med	An	SDL
An	An	Ph/Bi	Ph	Ph	
Ph	ECE	An	Ass	An	
CM	Ph	Bi	AETCOM	An	

Mon	Tues	Wed	Thurs	Fri	Sat
An	An	Intro	An	Bi	Ass
Ph	Intro	Ph	Intro	An/Rad	Ass
Bi	Ph	An	Ph/Med	Ph	SDL
An	An	BI	Ph/Mic	Ass	
Ph	ECE	Ph	Ph/Phar	Ph	
CM	Bi	Bi	AETCOM	An	

	AITO MI
	AITO Tuberculosis
	Unaligned sessions
	Shared sessions
	Nested sessions
An	Anatomy
Ph	Physiology
Bi	Biochemistry
Rad	Radiology
Intro	Introduction
Ass	Assessment

Representative timetable using showing how alignment can be done using a Aligned and Integrated Topic Based timetable

Figure 2b: Creating an aligned timetable using Topics

Mon	Tues	Wed	Thurs	Fri	Sat
Intro	An	An	An	Bi	Ass
Ph	Ph	Intro	An/Rad	An	Ass
Bi	Ph	PhBi	Ph/Med	An	SDL
An	An	Ph/Bi	Ph	Ph	
Ph	Ph/Bi	An	Ass	An	
CM	Ph	Bi	AETCOM	An	

Mon	Tues	Wed	Thurs	Fri	Sat
An	An	An	An	Bi	Ass
Ph	Intro	Ph	Intro	An/Rad	Ass
Bi	Ph	An	Ph/Med	Ph	SDL
An	An	Sh Ph/Bi	Ph/Mic	Ass	
Ph	Ph/Bi	Ph/Bi	Ph/Phar	Ph	
CM	Ph	Bi	AETCOM	An	

	CV system
	AITO MI
	Respiratory System
	AITO Tuberculosis
	Unaligned sessions
	Shared sessions
	Nested sessions
An	Anatomy
Ph	Physiology
Bi	Biochemistry
Rad	Radiology
Intro	Introduction
Ass	Assessment

Representative timetable using showing how alignment can be done using system based timetable with use of topics in each system to improve integration

Figure 2c: Creating an aligned timetable using organ systems and topics

Integration

Integration is a learning experience that allows the learner to perceive relationships from blocks of knowledge and develop a unified view of its basis and its application. The GMER 2019 applies these principles to the extent that will retain the strengths of subject based education and assessment while providing experiences that will allow learners to integrate concepts.

Keeping this in mind, the Regulations recommend the adoption of temporal coordination (called **alignment** in this document) as the major method to be followed allowing similar topics in different subjects to be learnt separately but during the same time frame (Fig 1a).

Example: Pancreatic Beta cell anatomy and histology, Pancreatic Beta cell physiology and Insulin structure and synthesis in biochemistry are usually taught at different times of the year. An effort is made to group these related topics in different subjects during the same time frame in the calendar (figure 3a and 3b).

In a small proportion - not to exceed 20% of the total curriculum an attempt can be made to **share** (figure 1b) topics or **correlate** (figure 1c) topics by using an integration or linker session. The integration session most preferred will be a case-based discussion in an appropriate format ensuring that elements in the same phase (horizontal) and from other phases are addressed.

Example: Since there is significant overlap in liver function in physiology and bilirubin metabolism in biochemistry - two departments could **share** sessions thereby reducing redundancy in what is being taught. (Note that it is not essential for two teachers to teach but it is important that the session is planned to ensure that the objectives of both subjects are achieved) (figure 3c).

As much as possible, the necessary correlates from other phases must also be introduced while discussing a topic in a given subject - **Nesting** (figure 1d).

Example: In a session on bilirubin metabolism a patient (a paper case is sufficient) with Dubin Johnson syndrome is **nested** as a short discussion to provide an understanding of what can go wrong, how does it manifest and what is the relevance and future application of learning bilirubin metabolism (figure 3e).

Care must be taken to ensure that achievement of phase based objectives are given primacy - the integrative elements from other phases are used only to provide adequate recall and understand the clinical application of concepts. It must be emphasised that integration does not necessarily require multiple teachers in each class. Experts from each phase and subject may be involved in the lesson planning but not it in its delivery unless deemed necessary.

Topics that cannot be aligned and integrated must be provided adequate time in the curriculum throughout the year. These concepts are summarised in table 1 and figure 3 (a-e).

Assessment will continue to be subject based. However, efforts must be made to ensure that phase appropriate correlates are tested to determine if the learner has internalised and integrated the concept and its application.

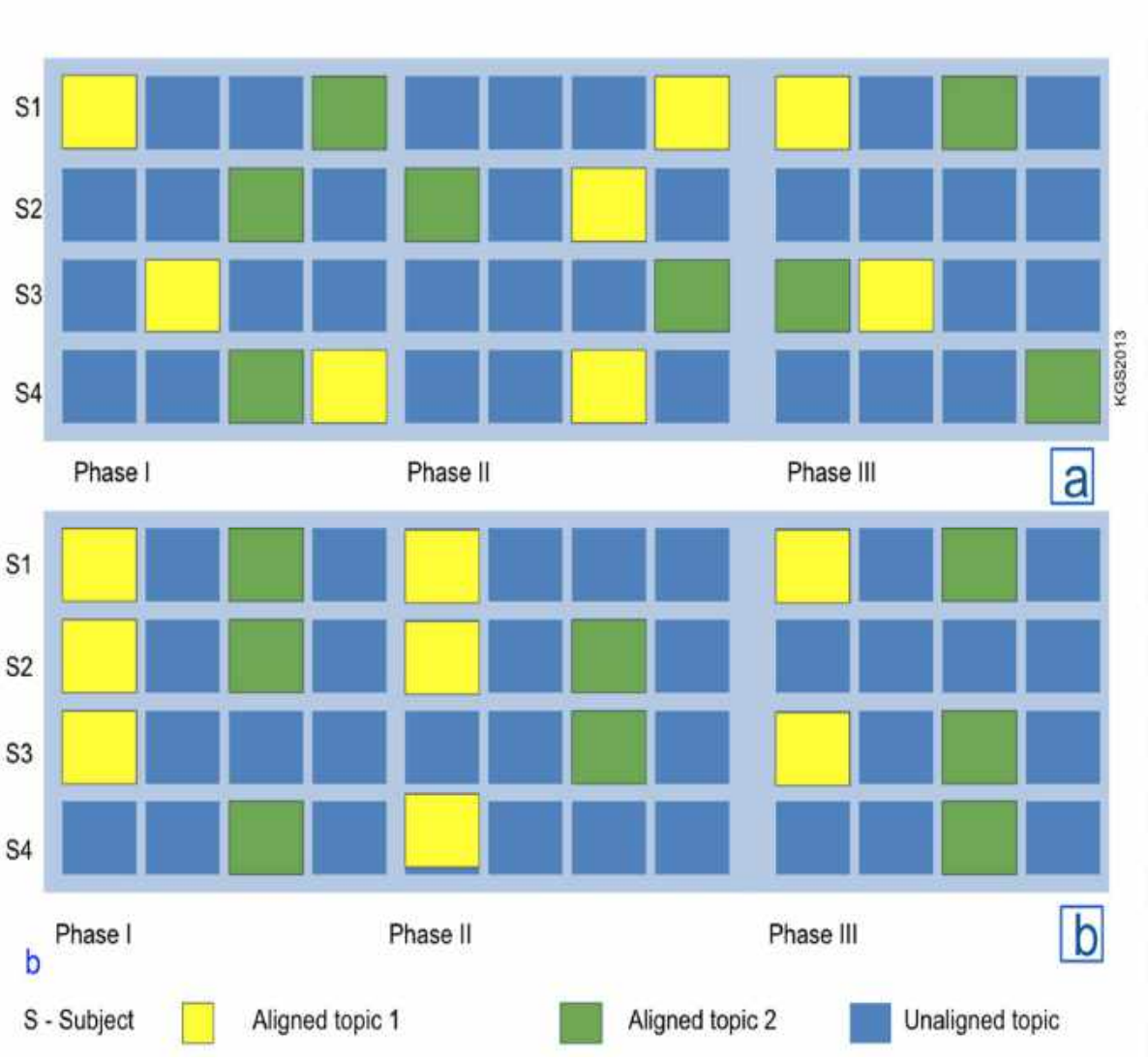
Table 1. Considerations for using alignment and integration in the curriculum

Competency /Objective	Same Phase	Different Phase
Cannot be aligned with a similar topic in a different subject eg. Lower limb anatomy and dissection	Teach separately	-
Can be taught together in different sessions in the same topic eg. Beta Cell histology in anatomy, Beta Cell function in physiology and structure and secretion of insulin, in biochemistry	Align	-
Can be taught in the same session in the same topic eg. Sharing - function of the hepatocyte, in physiology and bilirubin metabolism, in biochemistry eg. **Nesting** - Present the clinical features and laboratory data of patient with Dubin Johnson syndrome in a session on Bilirubin metabolism	Share	Nest
Can be used to link concepts taught in a particular topic eg. a patient with Type 1 Diabetes is used to understand the functions of the pancreatic islet - secretion and metabolism	-	Correlate

Figure 3: Pictorial illustration of alignment and integration concepts used in the GMER

Figure 3a: Traditionally topics which have the same core of ideas in different subjects are taught at different times.

Figure 3b: Alignment is teaching these related components of a topic from different subjects at the same time i.e, in a temporally coordinated fashion.



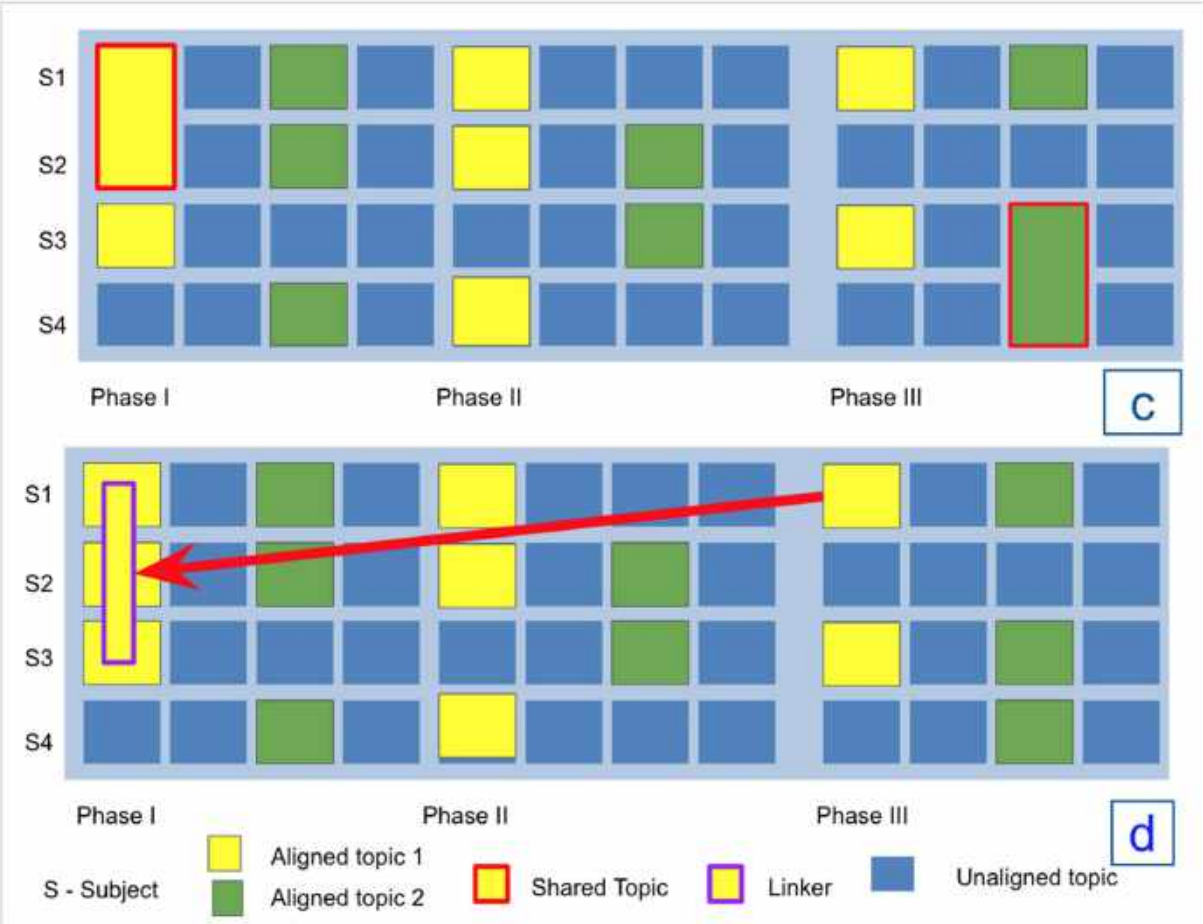


Figure 3c: Redundancy can be reduced by creating a session, merging session objectives from two or more subjects and creating a shared session (Box with red outline).

Figure 3d: Increased correlation can be achieved by using a Linker (Box with purple outline) - usually a case (with sufficient complexity) from the same topic from a higher phase is used to anchor the learning.

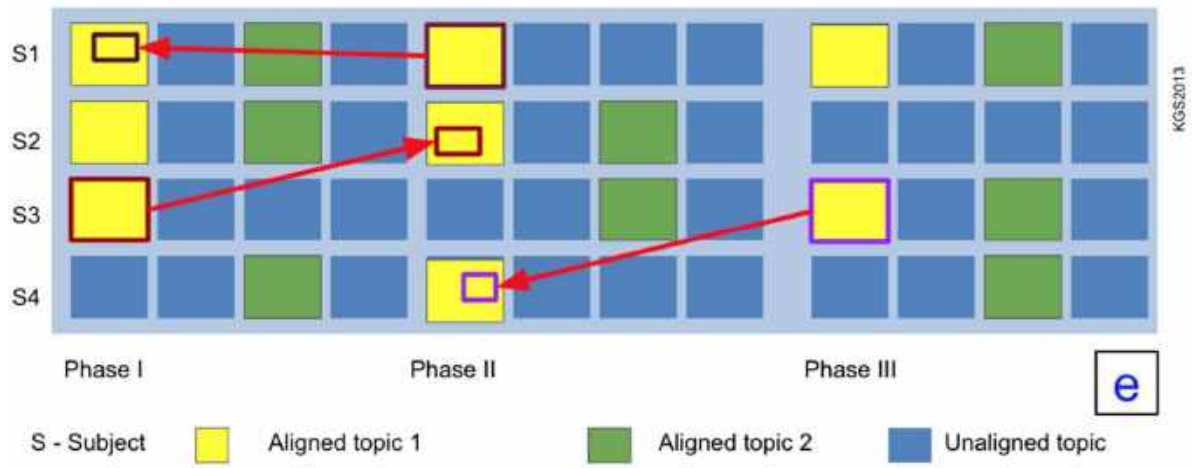


Figure 3e: Appropriate concepts from other phases can be brought into a phase: to increase relevance at a lower phase or increase prior recall or reinforce the fundamental basis at a higher phase. This is done by nesting some learning objectives from the topic in other phases into a learning session.

Steps in the development of Aligned and Integrated Topic (AITo) (Figure 4)

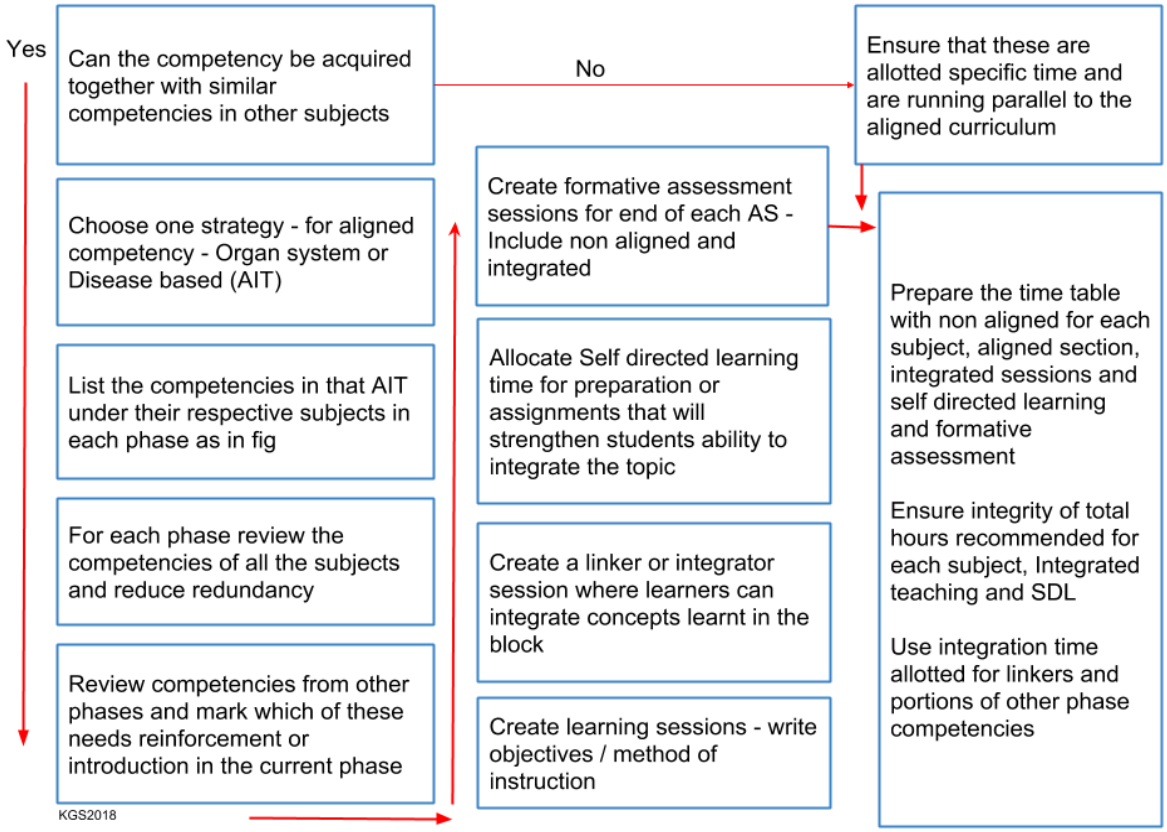


Figure 4: Overview of process to create an aligned and integrated topic

Step 1: Identify a list of topics or organ systems that will be accommodated in the timetable as aligned and integrated topics (AITo). Examples of such topics included: Anemia, Febrile illnesses, Trauma etc. are provided in Appendix 1 **of this book**. Examples of organ system are Cardiovascular System, Gastro-intestinal system, Endocrine system.

Step 2: From the subject-wise competency document book developed by the MCI, transfer the competences that address the topic into a template. Arrange these competencies according to phase and subject (see Appendix 3 for an example).

Examples for the topics are available in Appendix 1. A glossary to understand competency is available in Appendix 2. A comprehensive list of competency for the AITo Anemia is available in Appendix 3.

Step 3: For each competency, derive learning objectives, learning sessions and assessment methods.

a. A learning session is created by putting together a bunch of objectives that can be accomplished in the allotted time and/or require a similar method of instruction.

b. A bunch of learning sessions that are put together that address the topic from different subjects in the phase form an Aligned and Integrated Topic (AITo).

(See Figures 5-8 extracted from the Competency based UG curriculum document published by the Medical Council of India that illustrates this process).

Step 4: In each AITo of the phase, it is important to review competencies from the previous phase that will bear reinforcement in the current phase. Similarly, it is important to ensure that competencies in the next higher phases are reviewed to explore if some of these require introduction in this phase. Integration sessions allotted in each phase may be used to deliver these competencies.

a. By reviewing objectives / competencies in a phase, redundant ones and those in each subject that can be taught together without a subject demarcation can be identified for horizontal integration (**Sharing).**

b. Similarly, by reviewing objectives or competencies across phases, those with a common thread can be identified for vertical integration (**Nesting and Correlation**).

c. Objective writing and session planning must be done with teachers of all subjects involved in the aligned and integrated topic (AITo) and their inputs taken for the integrated session.

d. It is important to remember that ***the concept and not necessarily teachers*** have to be integrated. Using different teachers in each integrated session is nice but rarely required.

Step 5: Consider adding a **linke**r to each AITo. A linker, as defined above, is a session that aptly links the various related stand-alone elements represented in an AITo and helps **Correlate**. In the medical curriculum, the linker is most commonly a case. A case that is creatively written can be used in each phase (often the same case) to allow students to correlate what they have learnt and apply into understanding disease process, diagnosis and care. Using a case-based discussion in small groups will, in addition, encourage collaborative and self-directed learning. Using the case discussion at different time points in AITo, will allow students to reinforce and link concepts appropriately.

An example of creating learning sessions with objectives incorporating principles of alignment, sharing, nesting and correlation is illustrated in figure 9 (1-8).

Step 6: Ensure that adequate time for the AITo is created in the time table. It is important to consider the inclusion of an end of block assessment that will count towards formative/internal assessment.

Important: While creating the timetable ensure that topics in each subject that cannot be aligned are also taught simultaneously in each subject and that the timetable accommodates these topics appropriately.

An example of timetable incorporating an aligned and integrated topic is available in Appendix 4. The functions of the AIT team in collaboration with phase-wise Curriculum subcommittee and Curriculum Committee in creating the AIT is illustrated in figure 11 in the section on governance.

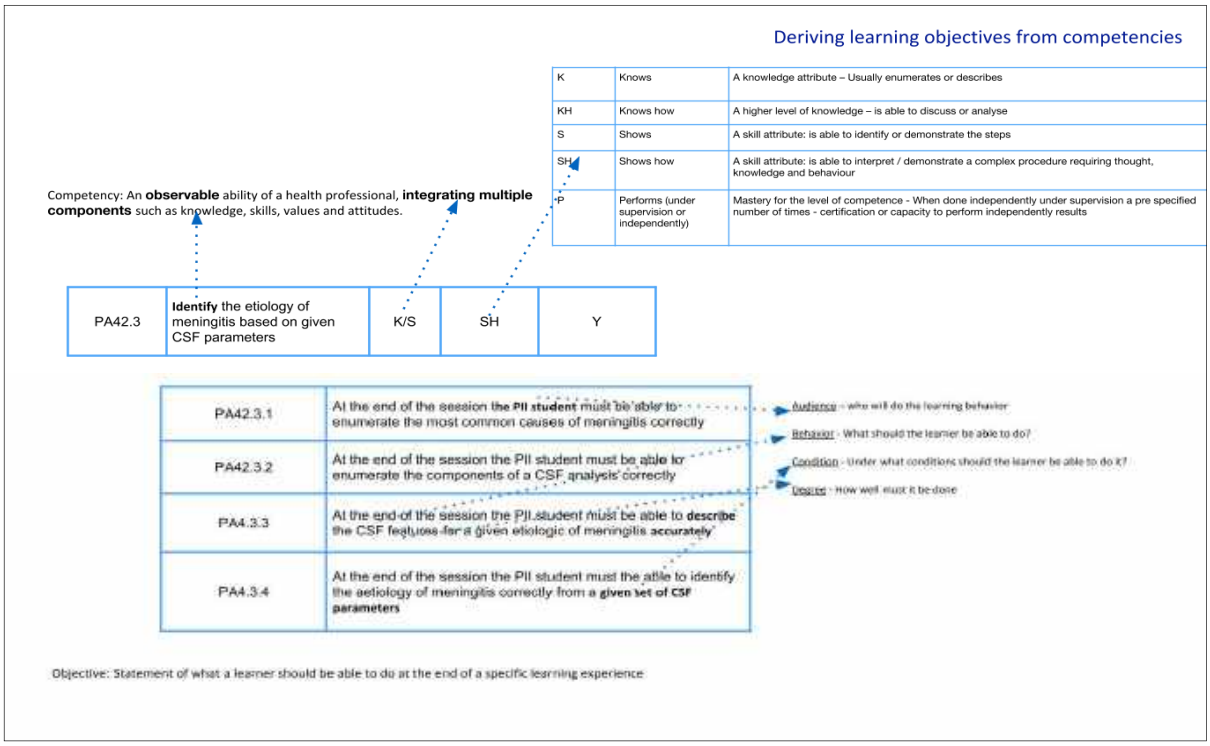


Figure 5 - Deriving learning objectives from competencies

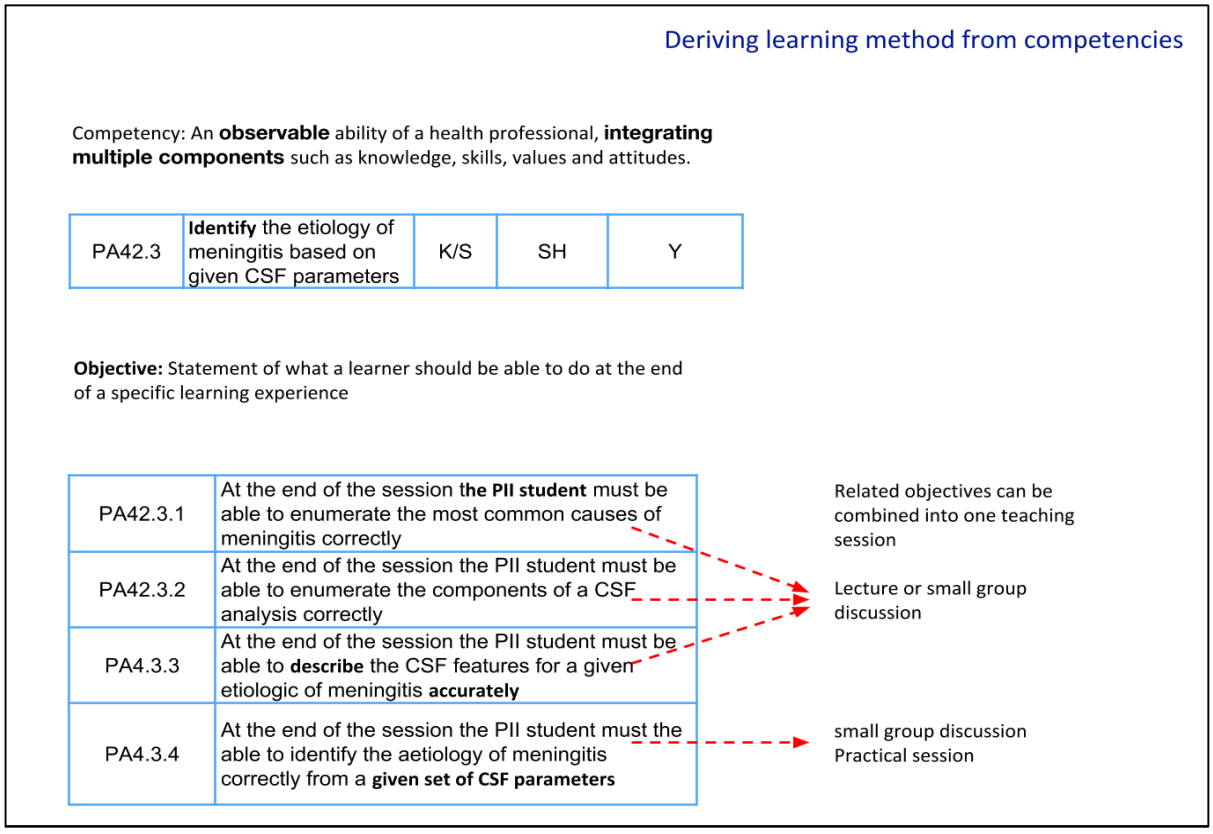


Figure 6. Deriving learning methods from competencies

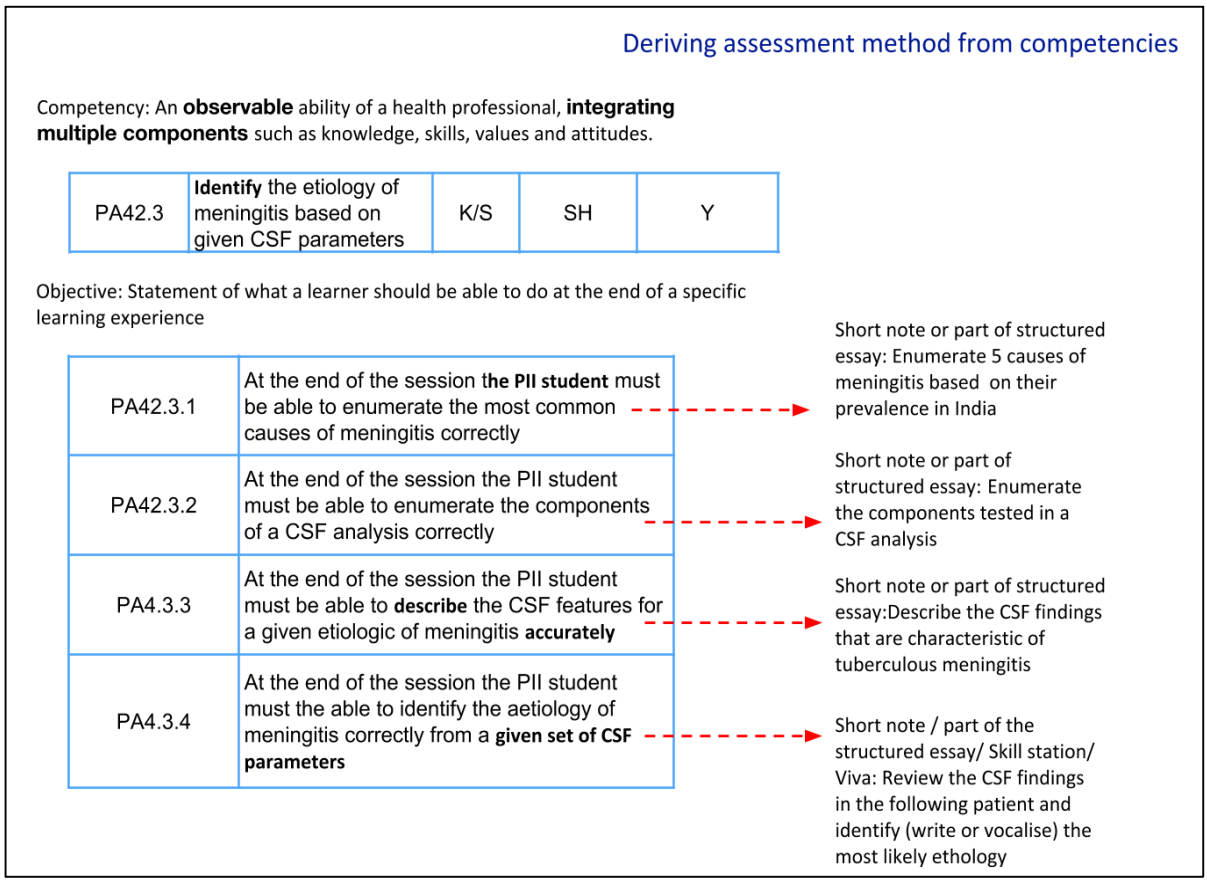


Figure 7: Deriving assessment methods from competencies

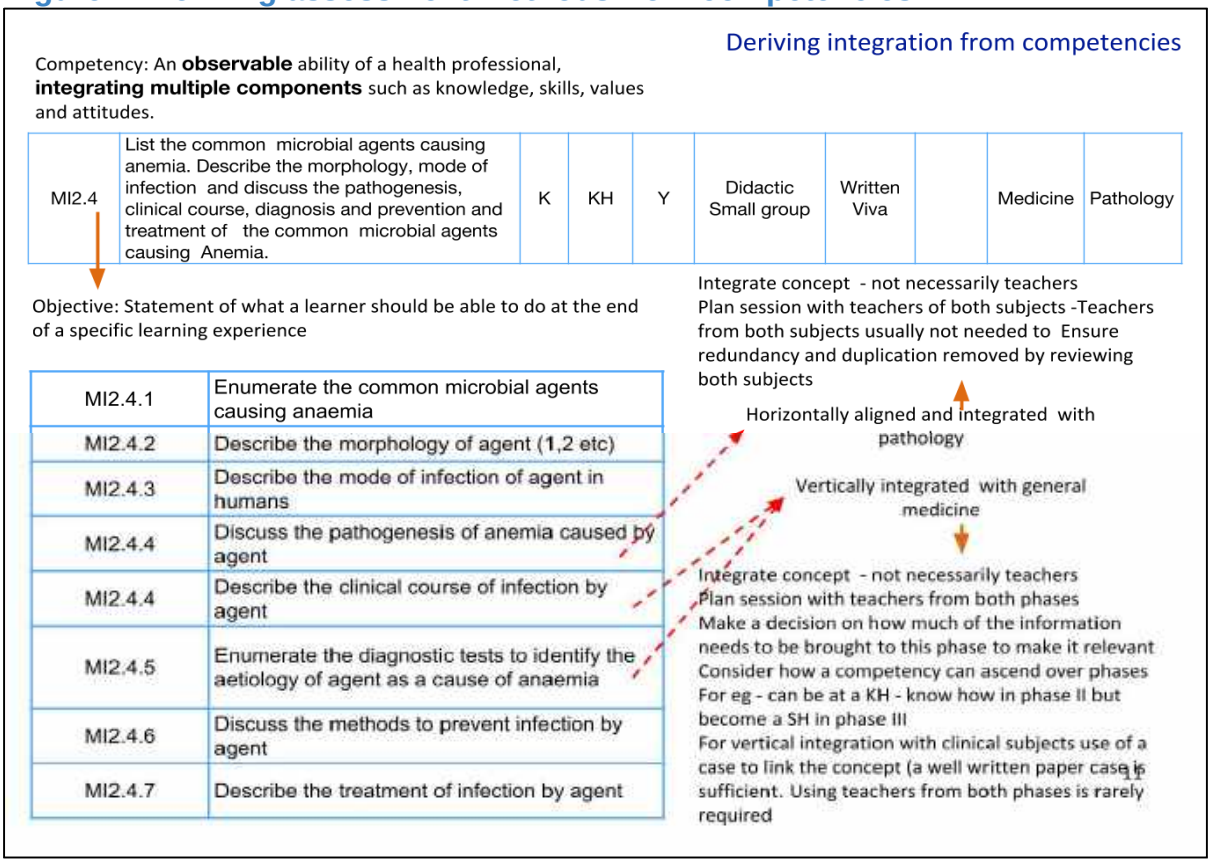


Figure 8: Marking objectives/ competencies for integration

Figure 9 (1-8) has used anemia as an example for creating an Aligned and Integrated topic.

Note: A comprehensive list of competencies for the topic anemia gleaned from the competency booklet is presented in Appendix 3.

For illustrative purposes only

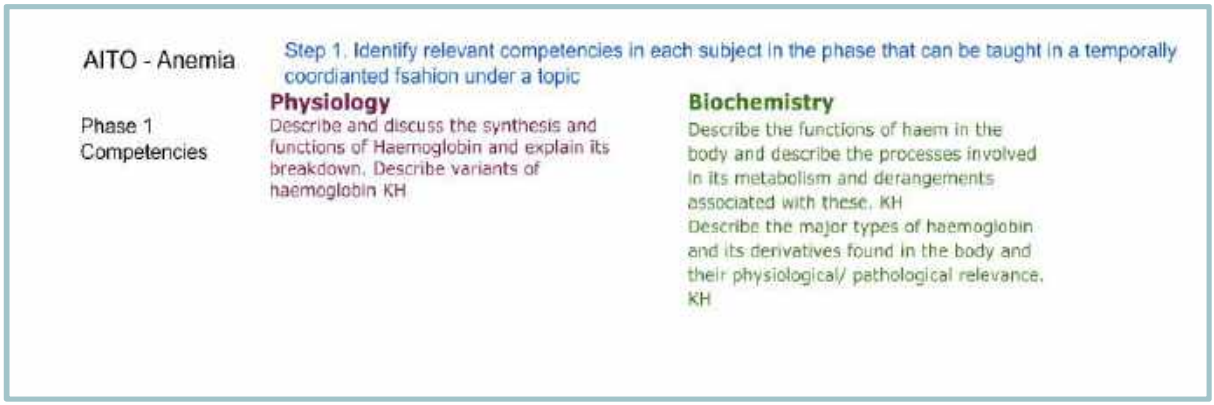


Figure 9.1 In this example two related competencies are identified from physiology (purple) and Biochemistry (Green) from the competency booklet

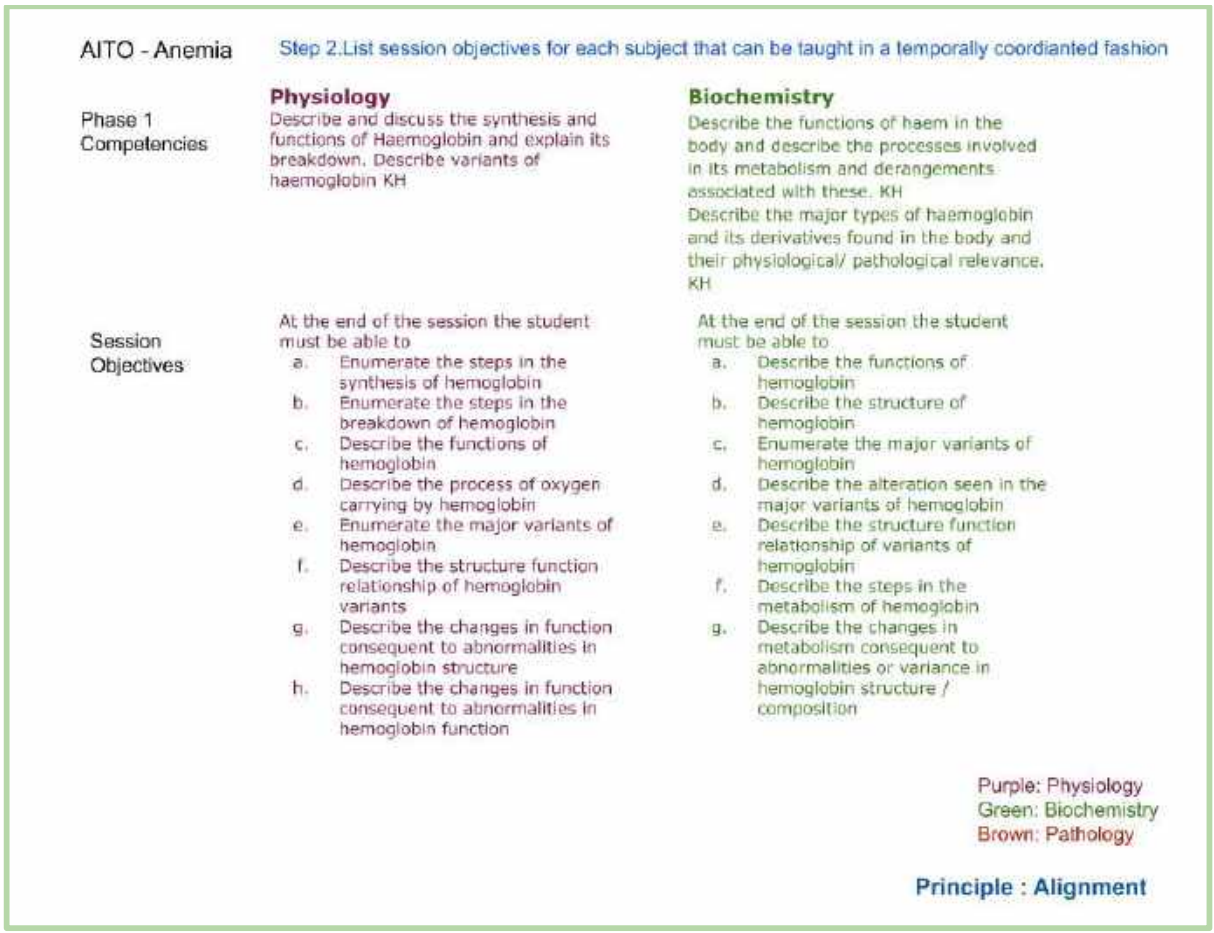


Fig 9.2 Session objectives are derived for each competency are identified

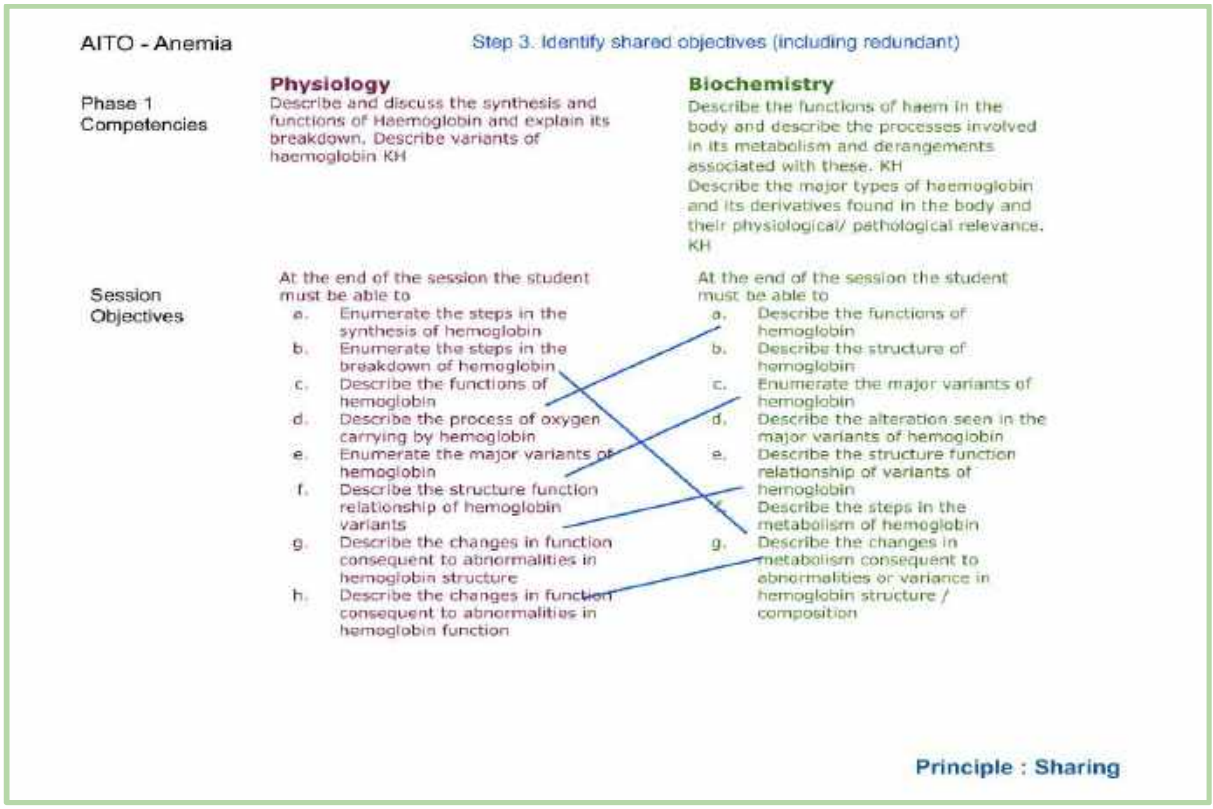


Fig 9.3 Objectives that are similar to both subjects are marked for redundancy and sharing

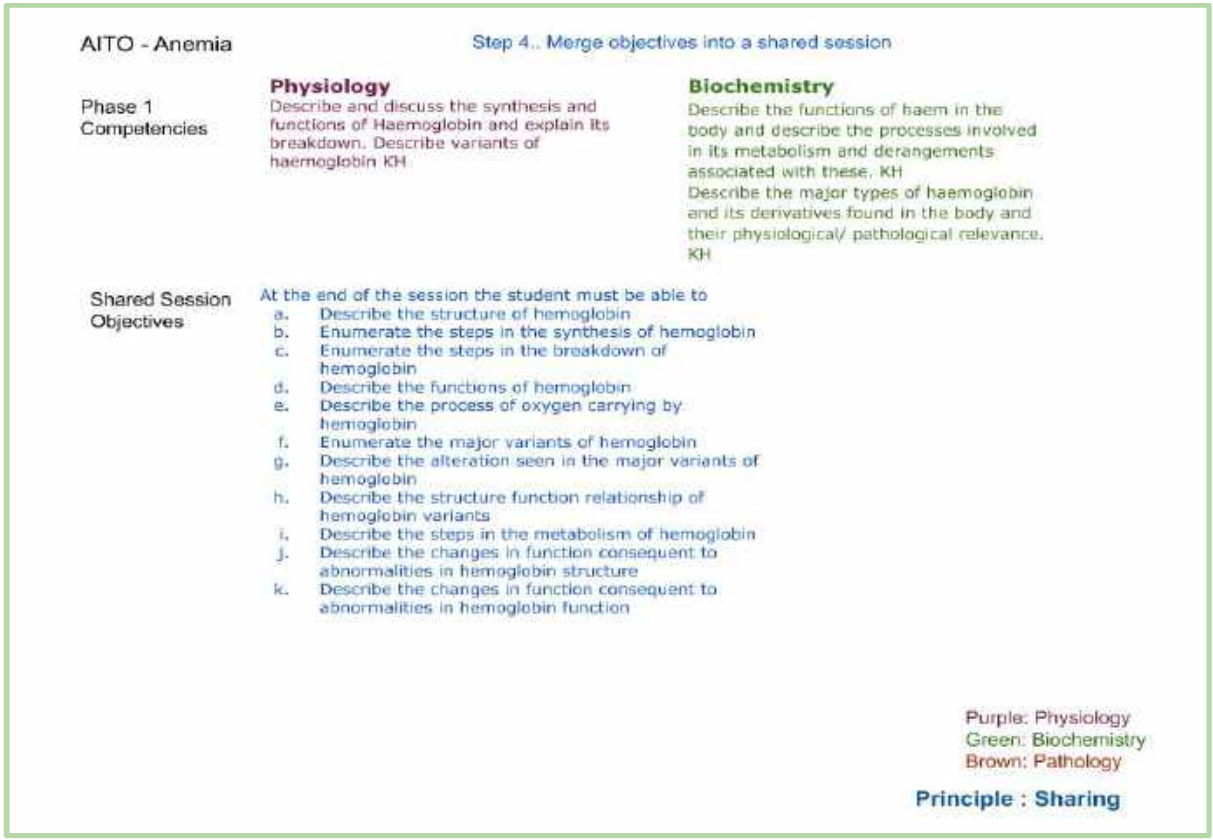


Fig 9.4 A new shared session is created merging the objectives from both subjects by removing redundancy

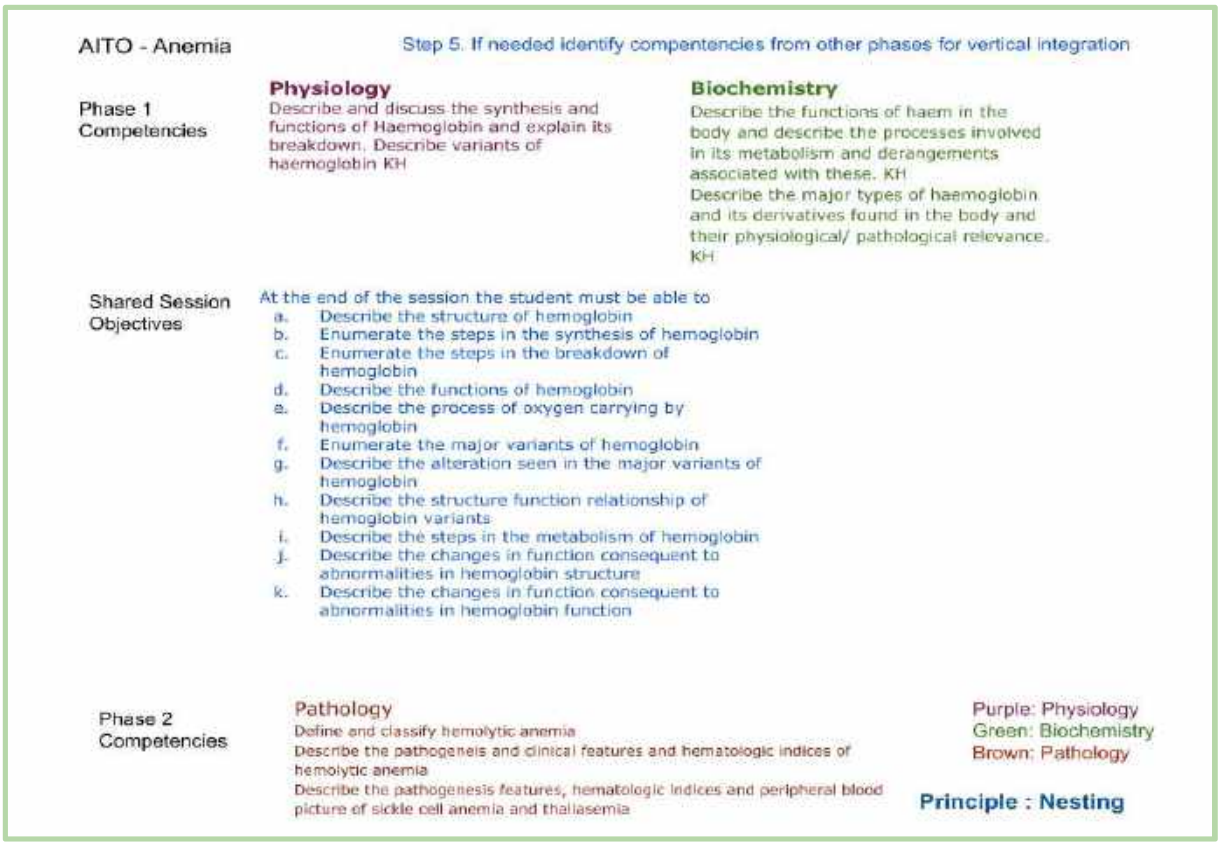


Fig 9.5 If desired, subjects from other phases are reviewed for competencies that will enhance the value of the learning session - in this instance a few competencies from pathology are brought into phase I to enhance the value of learning in the shared session.

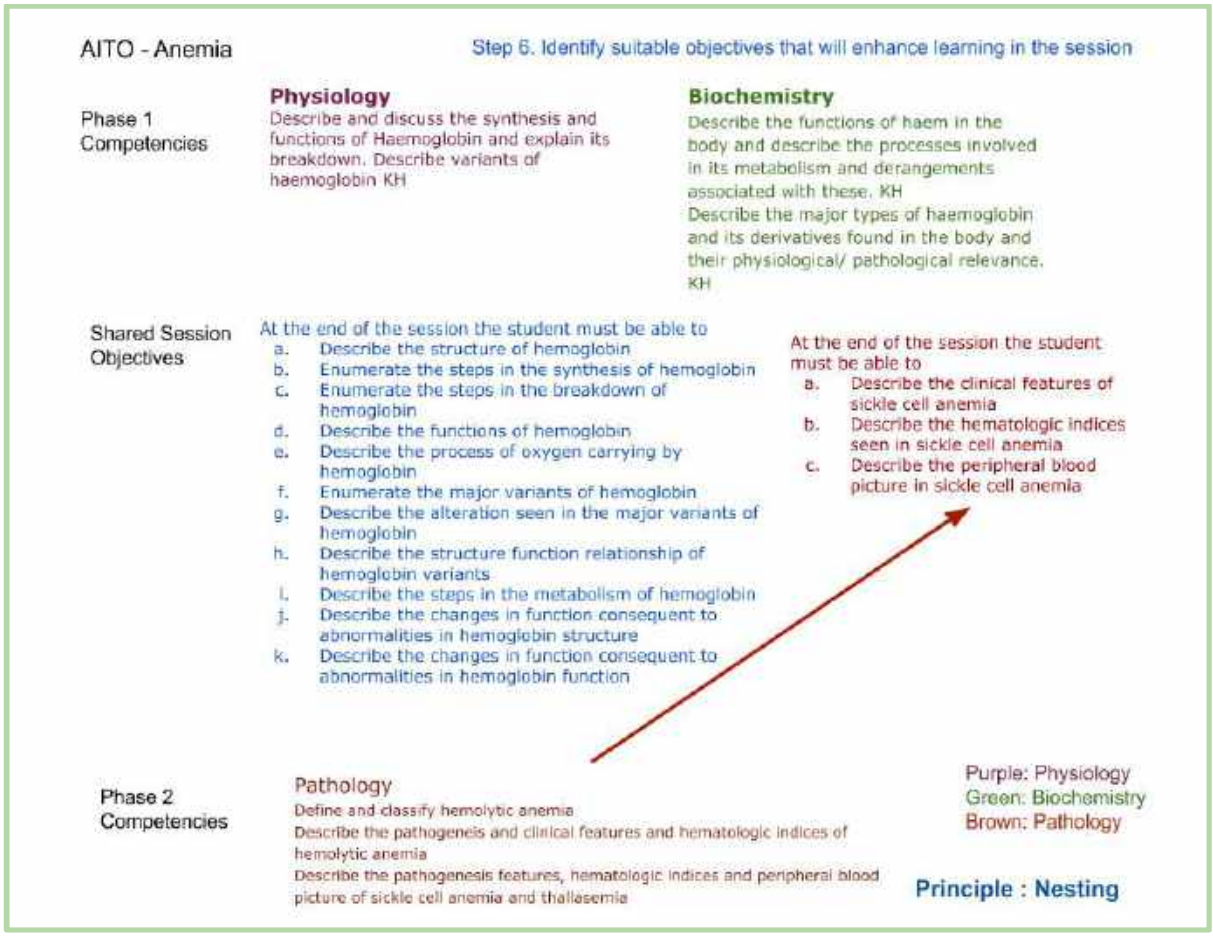


Fig 9.6 Objectives from the pathology (brown) competencies are listed

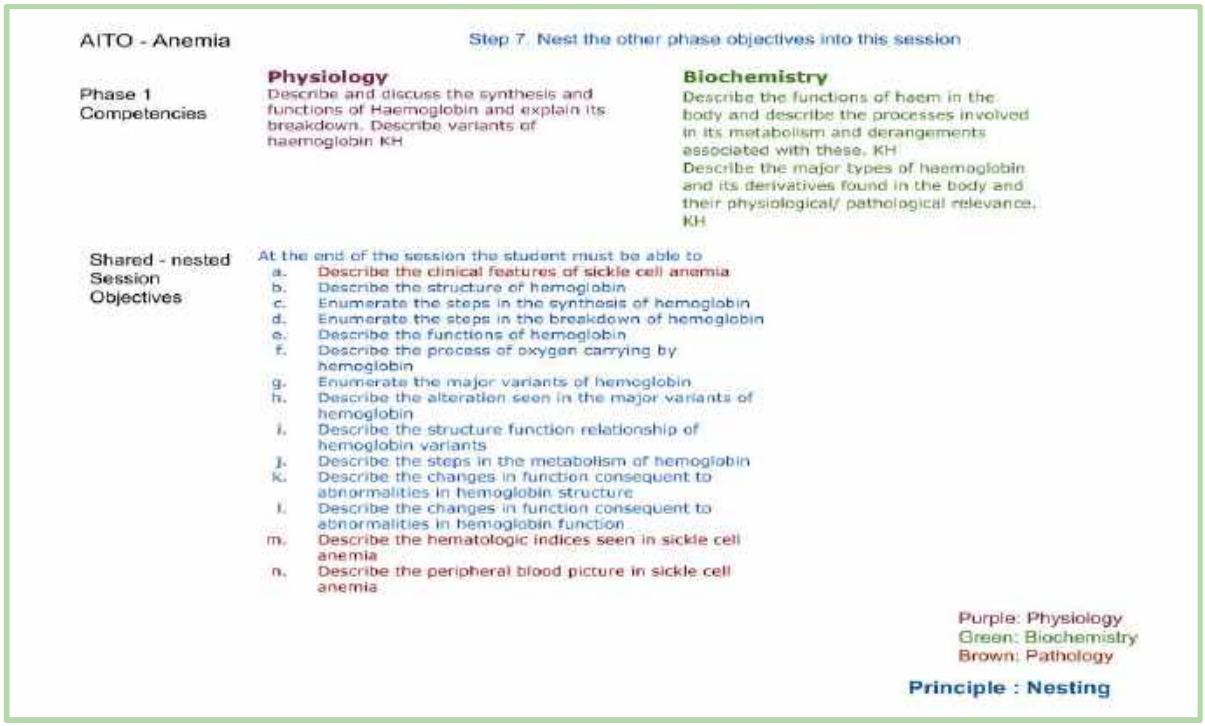


Fig 9.7: Selected objectives are “nested” to the shared session

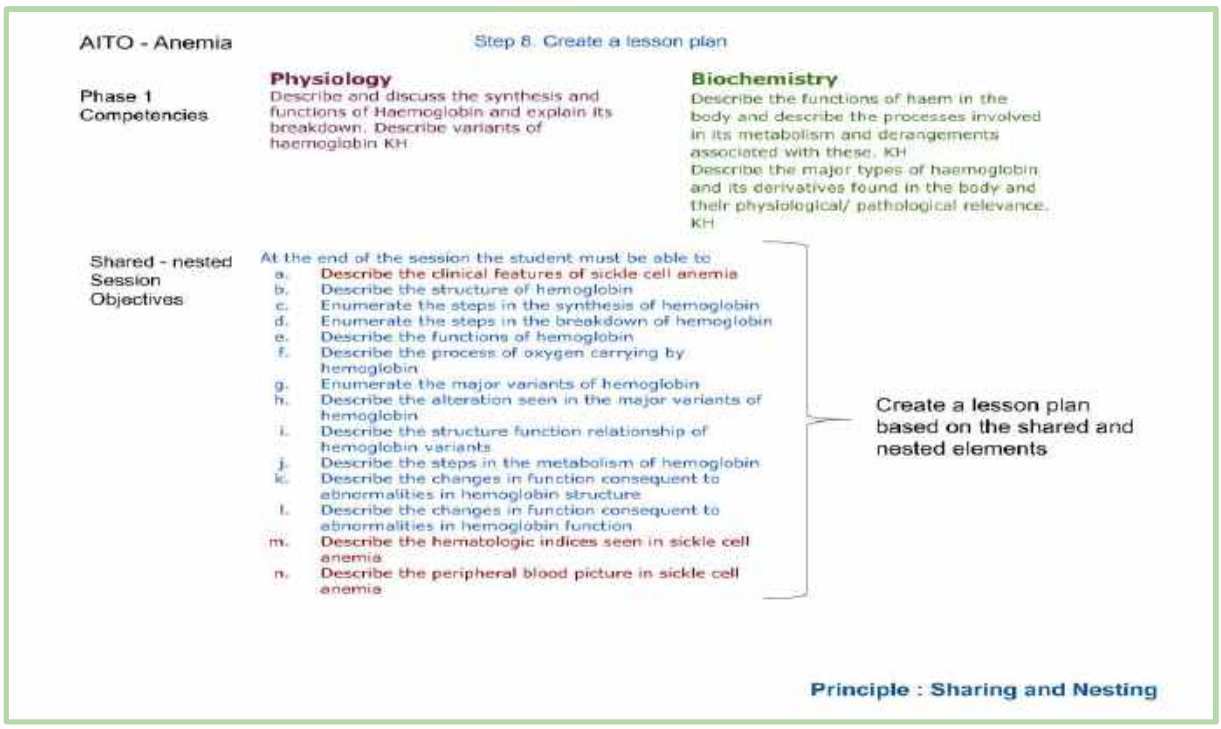


Fig 9.8 A lesson plan is created for the integrated session

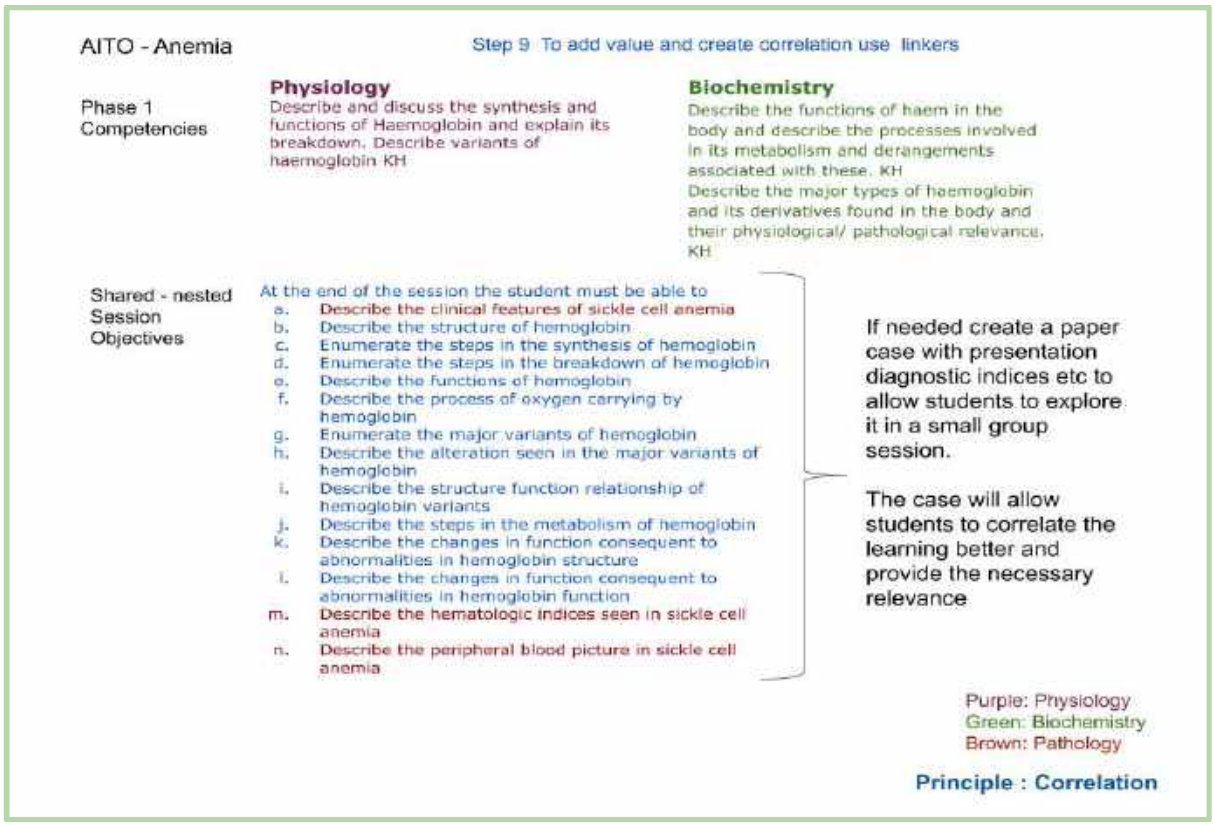


Fig 9.9 A paper case is often used as a linker to improve the relevance and allow greater correlation

Curricular Governance required to create and implement an Aligned and Integrated Curriculum

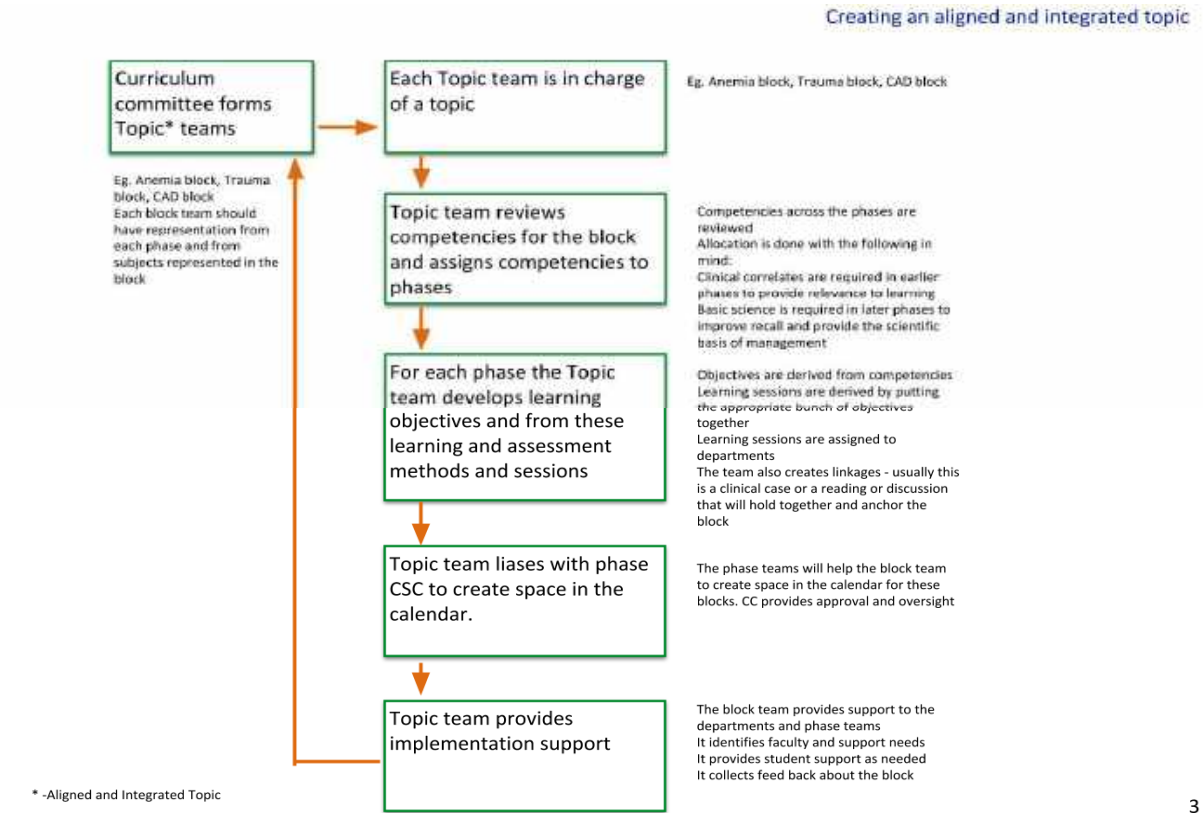


Figure 10: Steps and oversight required in development of Aligned and Integrated Topic

The development of an aligned and integrated curriculum will require significant collaboration from all stakeholders. In addition, curricular oversight will be required for its smooth implementation.

1. The Dean as the head of the institution and also as the Chairman of the Curriculum Committee will be responsible for the overall development, implementation and oversight of the curriculum.

2. The Curriculum Committee as constituted in accordance with the directives of the MCI will:

    a. Develop a strategy for creating and implementing the curriculum and providing oversight,
    b. Decide if the alignment will be topic or organ system based,
    c. Create a phase-wise Curriculum Subcommittee (PWCSC) to oversee the creation and delivery of aligned and integrated curriculum,
    d. Create and support topic teams which will develop objectives and learning sessions for each topic across the phases,
    e. Approve and release the annual timetable for each phase,

f. Liaise with the Medical Education Unit or Department for required faculty support.

3. The Phase-wise Curricular Sub-committees (PWCSC) may be constituted with heads of Departments or key faculty in each phase with adequate representation from other phases and reporting to the Curriculum Committee. The PWCSC should:

    a. Review competencies for each phase and convert them into learning objectives,
    b. Align the curriculum as much as possible and enlist help from other phases in creating necessary vertical integration and links,
    c. Reduce redundancy across the phase by integrating overlapping teaching elements,
    d. Develop learning and assessment methods for each phase,
    e. Prepare the timetable for the phase and present it to the Curriculum Committee for approval.

4. If needed, topic teams or Alignment and Integration (AIT) teams may be created. These teams will have at least one member from each department across phases and is responsible for delivery of the topics identified. The AIT team will:

    a. Create learning and assessment sessions of the Aligned and Integrated Topics (AITo) identified across phases,
    b. Represent the Aligned and Integrated Topic (AITo) to the phase-wise Curricular subcommittee and/or Curriculum Committee,
    c. Review competencies and develop learning objectives for the topic,
    d. Assign learning objectives to each phase and teaching session,
    e. Develop learning and assessment methods for the AITo,
    f. Help faculty with delivering session appropriately and in a collaborative manner across phases,
    g. Collect feedback for the AITo, and
    h. Provide student support.

Further reading

Required Reading

1. Ronald M Harden, The integration ladder: a tool for curriculum planning and evaluation, Medical Education 2000;34:551-557.
2. Alam Sher Malik & Rukhsana Hussain Malik, Universiti Teknologi MARA, Malaysia Twelve tips for developing an integrated curriculum". Medical Teacher 2011; 33: 99–104.
3. David G. Brauer & Kristi J. Ferguson 1, Washington University School of Medicine, USA, University of Iowa, USA; The integrated curriculum in medical education: AMEE Guide No. 96.
4. Integration of basic and clinical sciences - AMEE 2008 Paul Bradley and Karen Mattick, Peninsula College of Medicine and Dentistry, UK, https://amee.org/getattachment/Conferences/AMEE-Past-Conferences/AMEE-Conference-2008/Introduction-to-Medical-Education-Bradley-Mattick.pdf.

Additional reading

1. Gustavo A. Quintero, John Vergel, Martha Arredondo, Maria-Cristina Ariza, Paula Gomez & Ana-Maria Pinzon-Barrios, Integrated Medical Curriculum: Advantages and Disadvantages. Journal of Medical Education and Curriculum Development 2016; J Med Educ Curric Dev 3:S18920 (online).

Appendix 1

Examples of aligned and integrated topics (indicative)

Anemia
Jaundice
Diabetes
Thyroid Diseases
Nutrition
Febrile Illness
Tuberculosis
Malaria
Diarrhoea
Ischemic Heart Disease
Polycystic Ovarian Syndrome

Appendix 2

Understanding the competencies table

1	2	3	4	5	6	7	8	9	10
No.	**Competencies**	**Domain**	**K/KH/SH/ P**	**Core**	**Suggested Teaching Learning method**	**Suggested Assessment method**	**No req to certify P**	**Vertical Integration**	**Horizontal integration**
Physiology									
Summary **Name of Topic: General Physiology** **Number of competencies: (08)**							**Number of procedures that require certification: Nil**		
PY1.1	Describe the structure and functions of a mammalian cell	K	KH	Y	Lectures, Small group discussion	Written/viva			Biochemistry
GM25.4	Elicit document and present a medical history that helps delineate the aetiology of these diseases that includes the evolution and pattern of symptoms, risk factors, exposure through occupation and travel	S	SH	Y	bed side clinic, DOAP	Skill assessment		Community Medicine	

Unique number of the competency
First two alphabets represent the subject (see list)
Number following alphabet reflects topic
Number following period is a running number

Description of competency

Identifies the domain or domains addressed
K - Knowledge
S - Skill
A - Attitude
C - Communication

Identifies the level of competency required based on the miller's pyramid
K - Knows
KH- Knows How
S - Skill
SH - Show How
P - Perform independently

Identifies if the competency is core or desirable. Y indicates Core

Identifies the suggested learning method.
DOAP -
Demonstrate (by student) **O**bserve **A**ssist **P**erform

Identifies the suggested assessment method
Skill assessment - Clinics, Skills lab, Practicals etc

no of times a skill needs to be done independently to be certified for independent performance
Rarely used in UG

Subject(s) in other phases with which the competency can be vertically integrated to increase relevance or improve basic understanding

Subject(s) in the same phase with which the competency can be horizontally integrated or aligned to allow a more wholesome understanding

7

Appendix 3

How to choose competencies from different subjects in various phases for a given topic

(illustrative example)

Competencies for the topic anemia from various phases from the competency booklet volumes 1-3

Year	No.	Competencies*	No.	Competencies*	No.	Competencies*
1		**Physiology**		**Biochemistry**		
	PY2.1	Describe the composition and functions of blood components				
	PY2.2	Discuss the origin, forms, variations and functions of plasma proteins	BI5.2	Describe and discuss functions of proteins and structure-function relationships in relevant areas eg, hemoglobin and selected hemoglobinopathies		
	PY2.3	Describe and discuss the synthesis and functions of Haemoglobin and explain its breakdown. Describe variants of haemoglobin	BI6.11	Describe the functions of haem in the body and describe the processes involved in its metabolism and describe porphyrin metabolism.		
	PY2.4	Describe RBC formation (erythropoiesis & its regulation) and its functions	BI6.12	Describe the major types of haemoglobin and its derivatives found in the body and their physiological/ pathological relevance.		
2		**Pathology**		**Pharmacology**		**Microbiology**
	PA13.1	Describe hematopoiesis and extramedullary hematopoiesis	PH1.35	Describe drugs used in hematological disorders and discuss mechanism/s of action, types, doses, side effects, indications and contraindications, like 1. Drugs used in anemias 2. Colony Stimulating factors	MI2.4	List the common microbial agents causing anemia. Describe the morphology, mode of infection and discuss the pathogenesis, clinical course, diagnosis and prevention and treatment of the common microbial agents causing Anemia.

	PA13.2	Describe the role of anticoagulants in hematology		
	PA13.3	Define and classify anemia		
	PA13.4	Enumerate and describe the investigation of anemia		
3		**Medicine**		**Pediatrics**
	IM9.1	define describe and classify anemia based on red blood cell size and reticulocyte count	PE13.1	Discuss the RDA, dietary sources of Iron and their role in health and disease
	IM9.2	describe and discuss the morphological characteristics aetiology and prevalence of each of the causes of anemia	PE13.2	Describe the causes, diagnosis and management of Fe deficiency
	IM9.4	describe and discuss the genetic basis of some forms of anemia	PE13.3	Identify the clinical features of dietary deficiency of Iron and make a diagnosis
	IM9.5	elicit document and present a medical history that includes symptoms, risk factors including GI bleeding, prior history, medications, menstrual history, and family history	PE13.4	Interpret hemogram and Iron Panel

* List of competencies only representative, not complete.

Appendix 4 Sample time table with AIT

Time	Day1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	DAY 8
8-9 am	**Blood and its components by a Hematologist** Linker-Case 1 PY 2.1 Describe the composition and functions of blood and its components		Linker Part A of case 1 addresses PY 2.1 PY 2.2 PY 2.9 small group discussion + Formative assessment					Written Assessment PY 2.5 PA 13.3
9-10 am	**Blood groups , Principles of Blood transfusion and banking** PY 2.9 Describe different blood groups and discuss the clinical importance of blood grouping, blood banking and transfusion	**Blood groups , Principles of Blood transfusion and banking** PY 2.9 Describe different blood groups and discuss the clinical importance of blood grouping, blood banking and transfusion	**Erythropoiesis** - Linker part B PY 2.5 Describe RBC formation (erythropoiesis & its regulation) and its functions PA 13.1 Describe hematopoiesis and extra medullary hematopoiesis	**Role of Iron and Vit A B12 in Erythropoiesis** PA 14.1 Describe iron metabolism PA 15.1 Describe the metabolism of Vitamin B12 and the etiology and pathogenesis of B12 deficiency	**Heam synthesis and metab** PY2.3 Describe & discuss synthesis & functions of Hb & explain its breakdown. Describe Hb variants BI 6.11 Describe the functions of haem in body and describe the processes involved in its metabolism and derangements associated. Porphyrins	**Types of hemoglobin and their clinical significance** BI 6.12 Describe the major types of Hb and its derivatives found in body and their physiological/ pathological relevance.	**Physiology of Hemolysis and Anemia** PA 13.3 Define and classify anemia PY 2.5 Describe different types of anemias & Jaundice	Linker Part B of case 1 addresses PY 2.3 , BI 6.12 ,PY 2.9 , PA 13.3 small group discussion + Formative assessment
10 - 11 am 11-12.00	PY 2.9 Group A) Visit to the blood bank Group B) PY 2.11 Blood Grouping cross matching DOAP session	PY 2.9 Group B) Visit to the blood bank Group A) PY 2.11 Blood Grouping cross matching	**Peripheral smear examination** Group A PY 2.1 Describe the composition and functions of blood and its components OBJ A) Identify RBC , WBC and platelet in normal peripheral smear B) Discuss their functions Group B Visit to Hematology lab / Or ALC animation	**Physiology practical** Group A PY 2.11 Estimate RBC count and interpret normal Group B PY2.11 Estimate Hb, RBC indices and interpret PA 13.4 Enumerate and describe the normal blood parameters	**Physiology practical** Group B PY 2.11 Estimate RBC count and interpret normal Group A PY2.11 Estimate Hb, RBC indices and interpret PA 13.4 Enumerate and describe the normal blood parameters	**Physiology practicals** Group A PY 2.12 Demonstrate the tests for ESR, Hematocrit. Note the findings and interpret the results Group B PY 2.12 Demonstrate Osmotic fragility test . Note the findings and interpret the results	**Physiology practical** Group B PY 2.12 Demonstrate the tests for ESR, Hematocrit. Note the findings and interpret the results Group A PY 2.12 Demonstrate Osmotic fragility test Note the findings and interpret the results	Skill assessment PY 2.9, PY 2.11, PY 2.1, PA 13.4 ,PY 2.12
1-2 pm	**Plasma Proteins** PY 2.2 Discuss the origin, forms, variations and functions of plasma proteins	**Blood groups , Principles of Blood transfusion and banking** PY 2.1 ,2.2 PY 2.9 Formative Assessment Reflective exercise						Feedback-
2-3 pm	Non Aligned sessions in Anatomy					Radiological ANATOMY	Osteology	Remedial
3-4 pm						Surgical Anatomy	Surface Anatomy	
Submissions					PY 2.5 PA 14.1 PA 15.1 Assignment- 1 on Erythropoiesis and factors regulating	PY 2.3 BI 6.11BI 6.12 Assignment 2 on Haem synthesis and metabolism		

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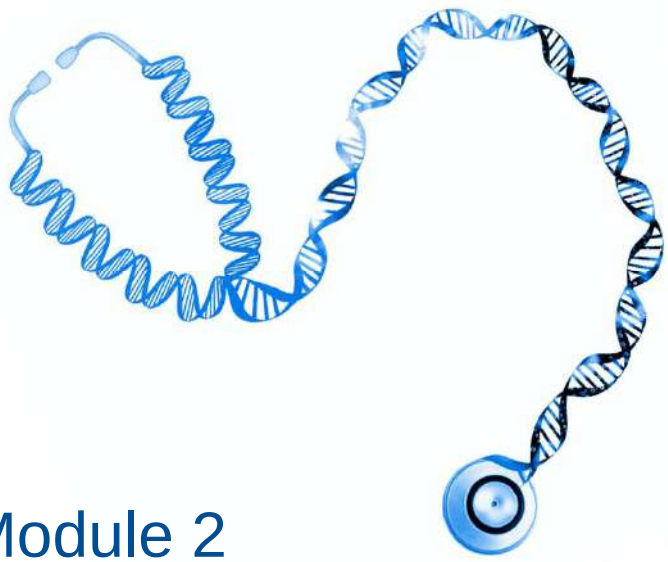

Analyse

Integrate

Guide

Communicate

Correlate

Interpret

Module 2

Early Clinical Exposure

Critique

Collaborate

Clinician Communicator Team Leader Professional Lifelong Learner

Knowledge | Skills | Attitude | Values | Responsiveness | Communication

Curriculum Implementation Support Program

Early Clinical Exposure for

Undergraduate Medical Education

Program

2019

Medical Council of India
Pocket-14, Sector-8, Dwarka,
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Foreword

Early Clinical Exposure

The primary objective of medical education is to prepare students for a lifetime of patient care. The students must not lose this perspective through their years of study. One of the key requisites of a curriculum is providing relevance to learning. The competency driven curriculum developed for the MBBS program has several unique features that guides student learning by maintaining a focus on patients.

Early Clinical Exposure introduces some aspects of clinical and social contexts of patient care into the first year of undergraduate teaching program. The purpose of this program is to provide a reference to basic science learning so that students can understand the applicative aspects of learning. Importantly it helps to reinforce comprehension of normal and its altered expression and disease states.

Early patient contact by the student is desirable because it introduces the learner to the most important stakeholder in his or her career at a nascent time; this will hopefully provide the stimulus and encouragement required for the learner to focus on the task ahead. Simple designed programs - allowing patient interaction/context in a supervised setting - will facilitate the student to learn from patient's perception of illness, its effect on health, its impact on family relationships and well-being and professional activity. Providing such opportunities for "immersive learning" early in the curriculum will shape the learner's commitment to care, empathy, altruism and service, the guiding principles enshrined in the new curriculum.

Introduction of Early Clinical Exposure in the undergraduate curriculum fulfills a long standing request of educators. This booklet incorporates some ideas and best practices gleaned from experts and institutions across the country. We are confident that each institution will add to this corpus of experience, their own lessons, cases and modules and hopefully share them with other institutions.

The Early Clinical Exposure program is designed to enrich the learning experience of the student and provide him or her tools that will not only strengthen the foundation laid in the first phase, but also bring to focus the larger import of learning done in that phase to future phases and career. We are grateful to the members of the Expert Group and the Academic Cell for painstakingly putting this booklet together. We hope that teachers and institutions will benefit from the suggestions provided herein and can successfully adapt and apply them into their own environment.

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Foreword

Early Clinical Exposure

This booklet provides a suggested pattern for the Early Clinical Exposure component for the MBBS program commencing 2019. The Early Clinical Exposure component allows students to understand basic science from an applicative perspective. The ability to learn concepts with their future application will generate interest and provide for greater retention and comprehension in the learner. One key aspect of this component is provision of authentic human contact. Exposure to patients and their families early will be a great influence on the professional and personal development of students and provide a stimulus to improved learning.

This booklet has been developed by experts invited by the Board of Governors in super cession of the MCI and incorporates their vast expertise and experience. The time and effort spent in creating this guide that can be used by institutions to develop their own learning process and content is gratefully acknowledged. Appreciation is also due to the efforts of the Academic Cell and of the faculty at various Regional and Nodal centers who worked tirelessly to ensure that the new competency driven curriculum and its various unique components are implemented fully and flawlessly across the medical colleges in the country.

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Curriculum Implementation Support Program

Module – 2

EARLY CLINICAL EXPOSURE

Early Clinical Exposure

Guidelines for Universities, Curricular Committees and Faculty

Early Clinical Exposure (ECE) provides a clinical context and relevance to basic sciences learning. It also facilitates early involvement in the healthcare environment that serves as motivation and reference point for students, leading to their professional growth & development.

1. Objectives of the Document are to:

- Describe the modalities of applications of ECE in a medical college
- Facilitate the development of modules of ECE for students
- Facilitate Implementation of ECEin their medical college

2. Introduction:

Students require context to understand basic sciences. They also require grounding in human and social aspects of the practice of medicine. Early clinical correlation and exposure to clinical environment will provide a point of reference and relevance to the novice learner. The ECE program in the MBBS curriculum tries to create an opportunity for students to correlate learning in Phase I subjects with their clinical application. Learning of basic sciences with respect to a clinical context can improve student's motivation to learn and also improve retention. It also provides authentic human context and early introduction to immersion into the clinical environment.

The MBBS curriculum has therefore been modified such that clinical exposure can be introduced earlier along with the basic sciences. Students will be able to learn the basic and clinical sciences by means of integrating learning activities, like early clinical contact, clinical skills, communication skills or task-based learning sessions.

Students can be exposed to clinical experiences in various forms and in a variety of settings which are outlined in this booklet. This does not reduce the

importance of traditional basic science instruction, but enriches and contextualizes the learning for the students.

3. Objectives of Early Clinical Exposure:

The objectives of early clinical exposure of the first-year medical learners are to enable the learner to:

(a) Recognize the relevance of basic sciences in diagnosis, patient care and treatment
(b) Provide a context that will enhance basic science learning
(c) Relate to experience of patients as a motivation to learn.
(d) Recognize attitude, ethics and professionalism as integral to the doctor-patient relationship
(e) Understand the socio-cultural context of diseases through the study of humanities

4. Elements of ECE:

The three elements of ECE are:

1. Provision of clinical correlation to basic sciences learning.
2. Provision of authentic human contact in a social or clinical context that enhances learning in the early/pre-clinical years of undergraduate education.
3. Introduction to humanities in medicine

Salient Principles:

The key principles underlying early clinical exposure are providing a clinical context and ensuring patient centricity. Early clinical exposure provides for the three key elements listed above. The clinical context can include case scenario, videos, actual patient, simulated patient etc. The presence of actual patients in every sessions of ECE, though not essential, is preferred. Therefore, ECE is exposure to the relevant clinical context in earlier years. It must be noted

that purpose of ECE is not to prepone the conventional clinical teaching but to provide better understanding of basic sciences through a clinical context.

5. Context from proposed GMER 2019:

9.2.1 Objectives:

The objectives of early clinical exposure of the first-year medical learners are to enable the learner to:

(a) Recognize the relevance of basic sciences in diagnosis, patient care and treatment
(b) Provide a context that will enhance basic science learning
(c) Relate to experience of patients as a motivation to learn
(d) Recognize attitude, ethics and professionalism as integral to the doctor-patient relationship
(e) Understand the socio-cultural context of diseases through the study of humanities

9.2.2 Elements:

a) **Basic science correlation:** To apply and correlate principles of basic sciences as they relate to the care of the patient (this will also become part of integrated modules).
b) **Clinical skills:** To include basic skills in interviewing patients, doctor-patient communication, ethics and professionalism, critical thinking and analysis and self-learning (this training will be imparted in the time allotted for early clinical exposure).
c) **Humanities:** To introduce learners to a broader understanding of the socio-economic framework and cultural context within which health is delivered through the study of humanities and social sciences.

6. Structure of the program for students:

Planning of activities & its distribution

It would be desirable to plan all teaching learning sessions in basic sciences around a clinical scenario so that students understand its relevance. But the clinical scenario in ECE should not be restricted to just the initial part of the teaching sessions, but form a framework around which learning will occur.

The time allotted for ECE in first year (as per GMR, 2019) is 90 hours which has to be equally divided among the three preclinical subjects. So the time available for each subject is 30 hours. It is suggested that, it can be further divided as follows:

1. **Basic sciences correlation** (18 hours): One three hour session per month for 6 months may be allotted. The clinical context can be introduced using actual patient contact or by use of paper based cases, charts (e.g. use of spirogram, electromyogram with its clinical correlation), graphics (e.g. using photos of gigantism/hypothyroidism/ Cushing's syndrome in endocrinology), videos (e.g. videos depicting normal & abnormal respiratory movements, embryology, endoscopy, laryngoscopy etc.), reports (e.g. blood/urine reports indicating biochemical markers), field visits etc. in community/ hospital laboratories.

2. **Clinical skills (experience and human context)** (12 hours): Three hour session per month for 4 months per department may be allotted. Cases may be demonstrated by preclinical faculty or clinicians, in out-patient departments/ wards/ demonstration rooms, as feasible, in small groups.

   Each 3-hour session of clinical experience can follow the guidelines below:

   - Introduction to the module & instruction by preclinical faculty: 30 minutes

- Clinical experience (in groups at different places like wards/OPDs/classrooms with guided observation/checklist): 1 hour 30 minutes
- Summary & conclusion (with learning points): 30 minutes
- Reflection (with guidance & monitoring) on what was learnt: 30 minutes

Examples of clinical context and related learning outcomes are provided in **Annexure I.**

Examples of deviations from normal to be observed and noted by student when exposed to clinical context are given in **Annexure II**. These can be used while preparing observation guides.

It is important to finalise a detailed observation guide for students and instruct them, before the actual interaction, regarding what he/she is supposed to observe during the ECE session. In observation guide, list out clinical features the student has to focus in the particular context. You may refer to the sample modules for ECE given in **Annexure III.**

3. **Humanities:** This will be merged with AETCOM module and therefore no additional time is allotted.

A sample for Humanities module is attached in **Annexure IV**

7. Formative & Internal Assessment:

Formative assessment will have a major role in the teaching of Early Clinical Exposure. The assessment must focus on students' activities during ECE. Students will participate in various activities such as case based scenarios, live patient's interactions, simulated patients, videos etc. A record of these activities should be maintained and assessed periodically.

Elements from ECE should be included as appropriate in formative and summative assessments of the respective subjects.

A) Internal Assessment:

Early Clinical Exposure should be part of internal assessment for the respective subject. During assessment, questions should test clinical correlation in basic sciences.

B) University Examinations:

It is suggested that examinations should include elements from ECE to test the ability of the student to apply basic science knowledge in clinical context.

The Modified Essay Questions (Problem based long answer questions), Clinical vignette based Short Answers Questions (SAQ), objective type questions (e.g. Multiple Choice Questions - MCQs) and OSPE can include parts of ECE. **Annexure V** gives examples of clinical vignette based short answer questions.

8. Capacity Building for Faculty:

Faculty Development:

Faculty need to be reoriented to the principles and practice of early clinical exposure. Preclinical and clinical faculty need to coordinate and involve in the activities related to hospital visits. Clinical faculty may be involved in the planning of ECE sessions. Faculty should be trained to develop, implement and assess ECE which is relevant to their subjects and phases including setting question papers, use of case based questions, assessing clinical context in earlier years and applications of the ECE.

9. Implementation, Monitoring / Curricular Governance:

Planning, Implementation and oversight of ECE is the responsibility of the Curriculum Committee of the college. The Curriculum Committee (CC) will work

in collaboration with phase-wise curriculum subcommittee (CSC), and Heads of departments to plan the ECE sessions and coordinate hospital visits.

Responsibilities of Principal/Dean

- Hold regular meetings of the Curriculum Committee and Heads of Departments
- Ensure implementation of ECE & monitor its activities.

Responsibilities of Head of Departments

- Function as Coordinator of ECE program in their disciplines

Responsibilities of Curriculum Committee

- To review regularly and record ECE activities & make necessary changes /adjustments as required from time to time.
- To help in scheduling ECE sessions for class-room, hospital & community visit
- To ensure that the competency based UG curriculum is implemented by all departments as per MCI guidelines.

Responsibilities of MEU

- To arrange the sensitization programs for all faculty members (including the Principal/Dean, Heads of departments of pre-clinical & related clinical departments)
- To train and orient the resource persons

10. Further Reading:

List of resources

Must read

1. Başak O, Yaphe J, Spiegel W, Wilm S, Carelli F, Metsemakers JFM. Early clinical exposure in medical curricula across Europe: An overview. Eur J Gen Pract. 2009 Jan 1;15(1):4–10.

Additional reading

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Annexure I

Examples of clinical context and related learning outcome

Clinical Context	Outcome
Parkinson's disease (Neurophysiology) *Patient/video/simulated patient/role play*	1. Demonstrate understanding of alterations in normal functions of Basal ganglia and their clinical expression. 2. Explain anatomical and physiological basis of signs & symptoms of Parkinson's disease 3. Observe examination of Motor system (Tone of the muscles) in a patient with Parkinson's disease
COPD (Respiratory Physiology) ***Patient/video/investigations***	1. Demonstrate understanding of alterations in normal respiratory physiology and anatomy in chronic obstructive lung disease and their clinical expression. 2. Explain the concept of restrictive and obstructive lung disease
Ascites (Abdominal system) *Patient/video/USG*	1. Demonstrate understanding of alterations in normal physiology and anatomy in portal system and their clinical expression. 2. Observe tests for eliciting presence of fluid in abdomen

Claw hand, Foot drop, Carpal tunnel syndrome (Peripheral nerve injuries) Patient/ video	1. Demonstrate understanding of alterations in normal anatomy & function of these nerves and their clinical expression. 2. Observe tests for eliciting normal function of these nerves
Clinical Context	**Outcome**
Varicose veins (Venous drainage of the lower limbs) *patient/video*	1. Demonstrate understanding of alterations in normal anatomy and physiology in peripheral venous system and their clinical expression 2. Demonstrate understanding of principles behind clinical examination of varicose veins
Type 2 Diabetes mellitus (T2DM) (Nutrition & Biochemical Lab tests) *patient/ Lab investigations*	1. Demonstrate understanding of alterations in metabolism and physiology in diabetes mellitus and its clinical expression 2. Explain the basis and rationale of biochemical tests done in diabetes mellitus
Obesity (Nutrition) *Video/Clinical parameters*	1. Demonstrate understanding of alterations in Metabolism and physiology in over nutrition and its clinical expression 2. Explain to the population the health risks associated with being overweight/obesity 3. Describe the metabolic and endocrine consequences of obesity.

Annexure II

Examples of deviations from normal, to be observed and noted by the student, when exposed to clinical context.

Example of the Disease / Disorder	**Deviations from normal, to be observed and noted by student, when exposed to clinical context. The students should be able to compare abnormal and normal**
Cerebellar dysfunction	Tremor, abnormalities of coordination, tone of muscles, findings on elicitation of knee jerk, ocular signs, abnormality in performing alternate rapid movements
Pneumonia	Presence of adventitious sounds on auscultation
Pleural Effusion	Position of mediastinum, findings on percussion, abnormalities of breath sounds
Arthritis	Swelling / Oedema & tenderness in the affected joint, restricted & painful joint movements
Jaundice/Anaemia	Examination for icterus /Pallor- site and colour
Cushing's syndrome	Moon face, hirsuitism, striae, buffalo hump

Annexure III

Sample Modules for ECE

ECE Module 1: Acute Myocardial Infarction (AMI)

Setting: Class room

Topic of Basic Science: Coronary Circulation

ECE through- Acute Myocardial Infarction case(Paper based case / Role play)

Goal:

The student must be able recognize the relevance of coronary circulation in diagnosis, patient care and treatment of Acute MI

Expected Competency:

1. Demonstrate understanding of alterations in normal anatomy and physiology of coronary circulation and its clinical expression.
2. Correlate the clinical manifestation in myocardial infarction with altered coronary circulation
3. Explain the basis and rationale of biochemical tests done in myocardial infarction.

Objectives:

At the end of the ECE module I MBBS student shall be able to:

1) Describe the mechanism of regulation of coronary circulation.
2) Describe the role of lipoproteins in derangement of coronary circulation.
3) Explain the biochemical changes occurring in acute myocardial infarction
4) Identify the clinical manifestation secondary to decreased coronary circulation.
5) Explain the basis of treatment of acute myocardial infarction

Learning Experiences:

Total time: 3 hours

- Introduction and instruction to students: 20 mins.

- Exposure to clinical context and discussion:90 mins
- Summary and conclusion: 10 mins
- Reflection: 30 mins
- Assignment: 30 mins

ECE: Classroom setting: 3 hours

Clinical Context:

A 48 year old company executive experienced a sudden, crushing chest pain, after he returned from his morning walk. His wife noticed that he was pale, sweating profusely and was in distress. She rushed him to the ICU of a nearby hospital immediately. He told the attending physician that on previous occasions too he had felt such pain but he it had subsided with rest. He is known smoker. He also suffers from diabetes, dyslipidemia and hypertension. ECG was taken & it showed ST elevation in leads II, III and AVF. He was admitted in the ICU.

**This clinical scenario can be either used as a paper based case or be performed as a role play if feasible.*

Facilitator's guide:

- *What is the probable reason for the severe pain in chest?*
- *Why did the regulatory mechanisms fail to meet increased demand of Oxygen ?*
- *How are diabetes Mellitus, hypertension and cardiac ischemia related?*
- *What do the changes in ECG indicate?*

Lab report:

Various investigations carried out 4 hours after the onset showed

- Raised cardiac specific troponin T & I
- Raised CK-MB
- Raised Cholesterol (Total, LDL and Triglycerides)

** get an actual lab report copy of a patient of Acute Myocardial infarction admitted at your hospital and use the same taking care not to disclose the identity.*

Facilitator's guide:

- Why are the cardiac Biomarkers raised?
- *What do the serum lipid levels indicate?*
- *What is the role of dyslipidemia in disruption of coronary circulation?*
- *What will be the next steps to manage acute MI?*

Formative assessment:

Submit assignment on the topic anatomical and physiological basis of treatment of acute myocardial infarction**.**

Reflections can be structured using the following guiding questions

- What happened? (What did you learn from this experience)
- So what? (What are the applications of this learning)
- What next? (What knowledge or skills do you need to develop so that you can handle this type of situation?

Program Evaluation:

✓ Feedback from students to evaluate for improvements in the module

1. How helpful has the ECE module been in improving your knowledge about coronary circulation?
2. Which components of the program helped you to learn?

3. Did the ECE module make learning basic science subjects more interesting?
4. Are you motivated to read further on this topic as a result of participating in ECE?
5. Suggest changes in the program that will help you learn still better.

- ✓ Written feedback from the faculty regarding their opinion as to whether outcomes were achieved and suggestions to improve the program

Resources

Appropriate text resources to be identified by the institutional subject experts.

ECE Module 2: Post - Myocardial Infarction Counseling

Setting: OPD

Topic: Coronary Circulation

ECE through- Post -Myocardial Infarction Counseling **(OPD visit)**

Goal:

The student must realize the relevance of basic sciences in patient care and relate to experience of patients as a motivation to learn

Expected Competency:

1. Demonstrate knowledge of process of counseling and communicating to patients with empathy, the dietary modifications and lifestyle changes in post coronary syndromes

Objectives:

At the end of the ECE module I MBBS student shall be able to:

1. Explain the basis of necessary dietary and life style modification to be undertaken in a patient recovering from Acute MI
2. Identify the salient features of effective communication between doctor and patient
3. Realize the impact of illness on patient's life

Learning Experiences:

- Introduction and instruction to students: 20 mins
- Exposure to clinical context: 45 mins
- Discussion: 45 mins
- Summary and conclusion: 10 mins
- Reflections: 30 mins
- Assignment: 30 mins

Part I - OPD setting: 45 mins

The Preclinical departments should arrange rotation of students to the OPD in collaboration with Medicine/ Cardiology / Cardiac Rehabilitation departments. Visits should be arranged in small groups so as to offer a better clinical experience. The clinicians should be made aware of the objectives of module. Patients recovering from Acute Myocardial infarction either treated with medications or interventions can be the focus for learning.

Observation Guide:

Students can be divided to observe different aspects of the doctor patient interaction and share ideas in post-clinic discussion.

Instructions to the students: During the consultation with a post-myocardial infarction patient, observe the interaction carefully.

Observation Guide to group A

Note down the lifestyle and dietary modifications advised by the doctor to prevent reoccurrence of MI.

Observation guide to group B

Observe the communication between the doctor and patient and list all the points in this interaction that helped the patient understand the information being shared. Also list the points that could be done to help the patient further.

Patient Interview:

Encourage one of the students in the group to interview the patient regarding how this illness has impacted his/her life.

Part II: Post clinic discussion: 45 mins

In small groups

- Students observing different aspects will share ideas.
- Facilitator must take care to give an opportunity to all students to voice their observations.

- All points emerging must be noted down on black board/ whiteboard during discussion.
- Facilitator to encourage the students to discuss the reasons for the dietary and life style modification to be undertaken in a patient recovering from Acute MI.
- Facilitator will also discuss the points of effective communication between doctor and patient, focusing on the importance of explaining in a way the patient understands.

  This can be linked with module 1.4 of AETCOM - the foundations of Communication-1 and used for introducing or reinforcing the principles of effective communication.

  For discussing points of effective communication, the Kalamazoo consensus statement which provides a working model for teaching communication skills can be used.

  1. Builds relationship
  2. Opens the discussion
  3. Gathers information
  4. Understands the patient's perspective
  5. Shares information
  6. Manages flow

  The other option is to use the Five A's behavior change model for health behavior change counseling to improve chronic illness care- Assess, Advise, Agree, Assist, Arrange.
- Discuss about how this illness affects the patient's life.
- At the end the student is asked to reflect on the experience and write it down in the log book.

Formative assessment:

- **Clinical skills:** Doctor patient communication can be assessed using Log book to record the patient details in the clinical experience. Reflections about

this patient encounter in the OPD is to be written down by the student and reviewed by teacher-in-charge of ECE.

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Reflections can be structured using the following guiding questions

- What happened? (What did you learn from this experience)
- So what? (What are the applications of this learning)
- What next? (What knowledge or skills do you need to develop so that you can handle this type of situation?

Program Evaluation:

✓ Feedback from students to evaluate for improvements in the module:

1. How helpful has the ECE module been in improving your knowledge about lifestyle changes post myocardial infarction?
2. Which components of the program helped you to learn?
3. Did the ECE module make learning basic science subjects more interesting?
4. Are you motivated to read further on this topic as a result of participating in ECE?
5. Suggest changes in the program that will help you learn still better.

✓ Written feedback from the faculty regarding their opinion as to whether outcomes were achieved and suggestions to improve the program

Resources:

1. Makoul G. Essential elements of communication in medical encounters: the Kalamazoo consensus statement. Acad Med. 2001; Apr; 76(4): 390-3.
2. Vallis, Michael et al. “Clinical review: modified 5 As: minimal intervention for obesity counseling in primary care” Canadian family physician Medecin de famille canadien vol. 59, 1 (2013): 27-31.

ECE Module 3: Parkinson's disease

Setting: OPD/ Classroom

Topic: Role of Basal Ganglia in Voluntary control of posture and movement

ECE through: Parkinson's disease (actual patient/ video)

Goal:

The student must realize the relevance of basic sciences in patient care and relate to experience of patients as a motivation to learn.

Expected Competency:

1. Demonstrate understanding of alterations in normal functions of Basal ganglia and its clinical expression.

Objectives:

At the end of the ECE module I MBBS student shall be able to:

1. Explain anatomical, biochemical and physiological basis of symptoms and signs of Parkinson's disease
2. Explain the difference between pyramidal and extrapyramidal lesions
3. Observe the examination of motor system

   *Please note that teaching-learning of the clinical skills must be supplemented by a DOAP session (Demonstrate Observe Assist Perform)on examination of Motor system or preceded by it, as feasible, so that the student is able to demonstrate the correct clinical examination of the motor system ultimately.

Learning Experiences:

- Introduction and instruction to students: 20 mins
- Exposure to clinical context and Discussion: 90 mins
- Summary and conclusion: 10 mins
- Reflections: 30 mins
- Assignment: 30 mins

ECE: Classroom setting: 3 hours

Actual patient/simulated patient with Parkinson's disease can be invited to the classroom or a video recording of the history and physical examination can be shown to the students as per feasibility.

Observation Guide:

Instructions to the students:

- During the consultation, listen carefully to the patient's complaints. Note the onset, duration and progress of these symptoms.
- Observe the physical examination carried out and note down the salient features of the examination.
- Try to find an explanation for his/her symptoms and signs.

Part II: Post clinic discussion: 1 hr

In small groups:

- Students will share their observations
- Facilitator must take care to give an opportunity to all students to voice their observations.
- All points emerging must be noted down on black board/ whiteboard during discussion
- Facilitator discusses the patient's history –onset of tremors and parts affected history of falls, poor balance, muscle stiffness, drooling of saliva, difficulty in writing, loss of memory along with change in voice and the basis of signs like: mask-like face, pill rolling movement, festinant gait and cog wheel rigidity.
- Facilitator also discusses the technique of examination of tone in the patient.
- At the end, the student is asked to reflect on the experience and write it down in the log book.

Formative assessment:

Basic Science correlation: To be assessed on the basis of assignment on 'Treatment options for the Shaking Palsy'

Reflections can be structured using the following guiding questions:

- What happened? (What did you learn from this experience)
- So what? (What are the applications of this learning)
- What next? (What knowledge or skills do you need to develop so that you can handle this type of situation?

Program Evaluation:

✓ Feedback from students to evaluate forimprovements in the module

1. How helpful has the ECE module been in improving your knowledge about Parkinson's disease?
2. Which components of the program helped you to learn?
3. Did the ECE module make learning basic science subjects more interesting?
4. Are you motivated to read further on this topic as a result of participating in ECE?
5. Suggest changes in the program that will help you learn still better.

✓ Written feedback from the faculty regarding their opinion as to whether outcomes were achieved and suggestions to improve the program

Resources:

Appropriate text resources to be identified by the institutional subject experts.

ECE Module4: Varicose Veins

Setting: Classroom & OPD

Topic of Basic Science: Front of Thigh / Veins of Lower limb

ECE through- Varicose vein case (Video / Patient)

Goal:

The student must be able recognize the clinical manifestations of altered anatomy of venous system.

Expected Competency:

1. Demonstrate understanding of alterations in normal anatomy and physiology in peripheral venous system and its clinical expression
2. Demonstrate understanding of principles behind clinical examination of Varicose veins

Objectives

1. Discuss the clinical manifestation of impaired venous drainage in Lower limb
2. Explain the basis of treatment of Varicose veins

Learning Experiences:

- Introduction and Instruction to students: 20 mins
- Exposure to clinical context and discussion: 90 mins
- Summary and conclusion: 10 mins
- Reflections: 30 mins
- Assignment: 30 mins

ECE: Classroom setting: 3 hours

A 40-year old male, bus conductor noted dilated engorged tubular structures over his calf and thigh region. These were becoming prominent after a long time standing posture.

**This clinical scenario can be used as either, a paper based case supplemented by video or on actual patient if feasible.

Facilitators guide:

- *What are these dilated engorged tubular structures?*
- *Why do these develop in lower limb only?*

Clinical Examination:

Trendelenburg's test and other clinical tests

**Perform Trendelenburg's test on actual patient, if available.

Facilitators guide:

- *What are the steps to perform Trendelenburg's test? What is anatomical basis for these tests?*
- *Which veins can be tested by this method and why?*
- *What will be the steps to manage varicose veins?*

Formative assessment:

- Structured Long answer question on veins of lower limb
- OSCE for demonstration of Trendelenburg's test
- Submit assignment on the topic medical and surgical basis of treatment of varicose veins.

Reflections can be structured using the following guiding questions:

- What happened? (What did you learn from this experience)

- So what? (What are the applications of this learning)
- What next? (What knowledge or skills do you need to develop so that you can handle this type of situation?

Program Evaluation:

✓ Feedback from students to evaluate for improvements in the module

1. How helpful has the ECE module been in improving your knowledge about varicose veins?
2. Which components of the program helped you to learn?
3. Did the ECE module make learning basic science subjects more interesting?
4. Are you motivated to read further on this topic as a result of participating in ECE?
5. Suggest changes in the program that will help you learn still better.

✓ Written feedback from the faculty regarding their opinion as to whether outcomes were achieved and suggestions to improve the program

Resources

Appropriate text resources to be identified by the institutional subject experts.

ECE Module 5: Type 2 Diabetes mellitus (T2DM)

Setting: Class room /OPD

Topic of Basic Science: Carbohydrate Metabolism

ECE through: Type 2 Diabetes Mellitus Case (Role play/ Paper based case/ actual Patient)

Goal: The student must be able recognize the clinical manifestations of altered carbohydrate metabolism

Expected Competency

1. Demonstrate understanding of alterations in metabolism and physiology in diabetes mellitus and its clinical expression
2. Explain the basis and rationale of biochemical tests done in diabetes mellitus

At the end of the ECE module I MBBS student shall be able to:

1. Explain the significance of estimating Blood glucose level, urine glucose and ketone bodies and HbA1c
2. Discuss the role of HbA1c in management of diabetes mellitus
3. List the guidelines to collect blood sample for glucose estimation
4. Interpret the results of the Blood glucose test, Urine glucose,urine ketones and HbA1c
5. Demonstrate the use of glucometer to estimate blood glucose level

Learning Experience:

Total 3 hours

1. Introduction & Instruction 20 mins
2. Exposure to clinical content and discussion in small groups 60 mins
3. DOAP - use of glucometer for estimating blood sugar level 30 mins
4. Summary & Conclusion 10 mins
5. Reflection &Assignment 30 mins

ECE Classroom setting:3 hours

Mr. Shukla, a 45 year old businessman was happy that he had lost 4 kg weight in last 2 months. He felt he was losing weight as he had started drinking more water than usual though he kept feeling hungry all the time. Maybe getting up at night too to empty his bladder was disturbing his sleep and made him feel tired all through the day.

His physical examination and lab investigations carried out as part of the yearly health checkup showed the following significant findings:

BMI: 28

Fasting Plasma Sugar: 180 mg/dl Urine Sugar: absent

Postprandial Plasma Sugar: 230 mg/dl Urine Sugar: +

Urine ketones: absent HbA1c: 7.9 %

He was asked to follow up with a physician so he has come to your OPD.

**Perform this clinical scenario as a role play. You may distribute copies of a mock lab report to aid discussion.*

Facilitator's Guide:

- *Explain what is happening with Mr.Shukla. What are alterations in normal physiology/ biochemistry that can explain clinical presentation of Mr. Shukla?*
- *Why is urine sugar absent in fasting sample?*
- *Explain the significance of raised HbA1c and high BMI in a patient of Type 2 DM*
- *Why should the blood sample for glucose be collected in fluoride -EDTA bulb or tube (grey).*

The facilitator will then have a DOAP session (Demonstrate Observe Assist Perform) on use of glucometer to estimate blood glucose levels

Formative assessment:

Basic Science correlation: To be assessed on the basis of assignment on 'Diabetes - A metabolic disorder'

Reflections can be structured using the following guiding questions:

- What happened? (What did you learn from this experience)
- So what? (What are the applications of this learning)
- What next? (What knowledge or skills do you need to develop so that you can handle this type of situation?

Program Evaluation:

✓ Feedback from students to evaluate forimprovements in the module

✓

1. How helpful has the ECE module been in improving your knowledge about disorders of carbohydrate metabolism?
2. Which components of the program helped you to learn?
3. Did the ECE module make learning basic science subjects more interesting?
4. Are you motivated to read further on this topic as a result of participating in ECE?
5. Suggest changes in the program that will help you learn still better.

✓ Written feedback from the faculty regarding their opinion as to whether outcomes were achieved and suggestions to improve the program

ECE Module 6: Acid -Base Disorder

Setting: Class room & Clinical Biochemistry Laboratory

Topic of Basic Science: Acid -Base Balance

ECE through: Acid -Base Balance Disorder Case (paper based case)

Goal: The student must be able recognize the clinical manifestations of altered acid base balance

Expected Competency:

1. Describe the processes involved in maintenance of normal pH of body fluids and the derangements associated with these.
2. Discuss and interpret results of Arterial Blood Gas (ABG) analysis in various disorders.
3. Observe use of ABG analyzer.

At the end of the ECE module I MBBS student shall be able to:

1. Explain the basis of the biochemical changes noted due to compensatory mechanisms in various acid base disorders.
2. Describe the use of ABG analysis and Serum electrolyte values in diagnosis of acid base disorders.
3. Describe and interpret the results of the ABG analysis in the different types of Acidosis and Alkalosis.
4. Describe the Principle of Arterial Blood Gas (ABG) analyzer

Learning Experience:

Total 3 hours

1. Introduction & Instruction - 15 mins
2. Exposure to clinical content and Discussion 1hr 30 mins
3. Demonstration of working of ABG analyzer 30 mins

4. Summary & Conclusion 15 mins
5. Assignment 30 mins

ECE Classroom setting: Objectives1-3can be achieved with the help of the following case and Objective 4 can be demonstrated in the Clinical Biochemistry Laboratory.

Part 1:

Mrs. Rajashree is a 45 year old teacher. She was suffering from severe diarrhea for the last 5 days. The stools were watery and copious. She also complained of fatigue and shortness of breath since morning.

Facilitator's Guide:

- *What is the critical course of events that will alter her acid base status?*
- *What acid base abnormalities would you expect in her based on above information?*
- *What physical findings would you expect from this acid base disturbance?*

Part 2:

Her blood reports were as follows:		
Fasting Blood Sugar: 100 mg/dl		$PaCO_2$: 30 mmHg
pH: 7.24	Cl^- :106 meq/L	Na^+ 134 meq/L
HCO_3^-: 15meq/L	K^+: 4.2meq/L	

Facilitator's Guide:

- *Review the Biochemical report. What is the primary abnormality? How did you decide that?*
- *What are alterations in normal physiology/ biochemistry that can explain clinical presentation of Mrs. Rajashree ?*
- *Is the compensatory response observed?*
- *Calculate the anion gap and interpret the findings.*

Part 3:

Laboratory Visit:

The students to observe the working of an ABG analyser in the Laboratory

Facilitator's Guide:

- Facilitator will demonstrate the working of an ABG analyzer and explain its principle.

Formative Assessment:

Students can be given various ABG reports to interpret and explain the compensatory response that would occur.

Reflections can be structured using the following guiding questions:

- What happened? (What did you learn from this experience)
- So what? (What are the applications of this learning)
- What next? (What knowledge or skills do you need to develop so that you can handle this type of situation?

Programme Evaluation:

- ✓ Feedback from students to evaluate and modify program
    1. How helpful has the ECE module been in improving your knowledge about Acid- Base disorders?
    2. Which components of the program helped you to learn?
    3. Did the ECE module make the basic science subjects learning more interesting?
    4. Are you motivated to read further on this topic as a result of participating in ECE?
    5. Provide suggestions to improve leaning further.
- ✓ Written feedback from the faculty regarding their opinion as to whether outcomes were achieved and suggestions to improve the program

Annexure IV

Humanities Module

Study of medical humanities plays a pivotal role in preparing students to practice in the community. It develops the students' capacity to listen, interpret and communicate with patients. Appreciating the subjective aspects of a person's healthand illness will enable them to offer individualised care. It will also provide a channel to the students to express themselves through creative mediums of literature, music and arts.

Literature and Medicine

Background

Medicine is an integral part of literature - classic popular and science fiction. A whole genre of medical fiction exists which reflects the community's view of the medicine, its system and health care workers. Literature also portrays human suffering and gives learners perspectives quite different from that obtained from teachers. Many doctors are prolific writers and have written about personal suffering as well as the impact of medicine. The module allows the learner to explore medicine and human suffering from a literary perspective.

Competency addressed

The learner must explore, discuss and reflect on human illness suffering and medicine as portrayed in literature (classic/contemporary)

Learning Session

Year of Study: 1

Hours: 8 hours

Exploratory session: 2 hours

Self-directed Learning: 4 hours

Research / Task / Report

Discussion and closure: 2 hours

Description:

1. An exploratory session is created where either in small groups or an interactive large group, students are allowed to speak about the portrayal of suffering illness and health care workers and the system as portrayed in classic and contemporary literature. Evoke questions about regional literature in particular. Explore differences in portrayal of doctors in classic vs. contemporary literature. Evoke a discussion about doctors accounts of their own suffering
2. Students, individually or in groups, are asked to choose and read and report on a book that has affected their view of the illness, suffering or the medical profession
3. **Discussion and closure:** A closure session where students share their reflection based on their tasks and learnings and their implications

Assessment

Submitted Narrative and reflections

Annexure V

Clinical vignettes for short answer questions

Sample 1

A 55 year old man complained to his general practitioner that he felt tired easily. He also complained of dizziness, sweating and palpitations after meals. He had undergone partial gastrectomy seven years ago involving removal of major part of body and fundus of the stomach. Since last 2.5 years he had stopped taking Vit B_{12}injections.

Q. Explain the physiological basis of:

a. Need of Vit B_{12} injections after partial gastrectomy involving fundus and body of stomach.

b. Symptoms of dizziness, sweating and palpitations observed after a meal in this patient.

Sample 2

A 35 year old male patient reports to the out-patient department with complaints of increasing stretch marks and muscular atrophy. He also complained of increased weight gain especially on the upper back area.

Q.a. Explain the biochemical features **expected** in this patient.

Q.b. Explain the biochemical basis of the tests used to confirm and further evaluate the cause of this condition.

Sample 3

A patient with a diagnosis of leprosy came to the hospital with complaints of absence of sensation in right hand. Clinical examination showed sensory loss in medial one and half finger & medial side of palmar-dorsal aspects of right hand. There was also flattening of hypothenar eminence &difficulty in holding paper tightly between the affected fingers on right side.

Q.a. Mention the affected structure.

Q.b. Describe branches and area of distribution of the affected structure in hand.

Q.c. Explain the anatomical basis of flattening of hypothenar eminence.

Q.d. Explain the difficulty in holding of paper tightly between fingers on right side.

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COMPETENCY BASED UNDERGRADUATE CURRICULUM
FOR THE INDIAN MEDICAL GRADUATE

Knows Knows how Shows Shows how Performs

Describe Observe Demonstrate
Enumerate Assist

Counsel Prescribe

Analyse Integrate

ELECTIVES

Guide Communicate

Module 6

Correlate Interpret

Critique Collaborate

Clinician Communicator Team Leader Professional Lifelong Learner

Knowledge | Skills | Attitude | Values | Responsiveness | Communication

Curriculum Implementation Support Program

Module on Electives

for

Undergraduate Medical Education

Program

2020

Medical Council of India
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Foreword
ELECTIVES

Students who join medicine come in with many professional and personal aspirations. While meeting the needs of the profession and nation, the MBBS program is also designed to create time and opportunity for students to explore future interests. Allowing students time to experience a specialty or project of their choice is thus key to helping student interest bloom.

Creating a diversity of choices within a specified framework that will allow students to be part of a laboratory, participate in research, be part of a super-specialty care team or interact with patients in a community care setting is a mandate of the new regulations notified by the Government of India. Electives allow students to get a taste of a future career; they also allow them to pursue academic interests, do projects and work in diverse environments. These experiences outside the traditional boundaries of the core program allow students to reflect, plan and grow their careers. They also allow students to begin the process of professional networking early.

Institutions must give sufficient importance to the planning and execution of electives. Besides creating diverse opportunities, thought must be given to providing a safe and enabling environment for students to learn. Identifying and orienting preceptors for this purpose, developing portfolio and log book events and continuous program evaluation are key to the success of the program. I urge all institutions to look beyond traditional boundaries to create areas of opportunity for students. Strategic collaborations with centers of excellence will increase value for students while building bridges of collaborative work among institutions.

This booklet is designed to help institutions plan and execute elective rotations. The Expert Group has elucidated a balanced approach that can be followed by all institutions. As always we are keen to learn and share any best practices that institutions develop. I am grateful to the Academic Cell of MCI and the Expert Group as well as the nodal and regional centers of the MCI for their continued contribution in supporting institutions and teachers in implementing the forward looking changes in the new competency based UG curriculum.

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Foreword

Electives

Changes in the Graduate Medical Education Regulations notified by the Government of India in 2019 have been done with a view to create physicians of first contact who are relevant to both their community and the globe. These regulations aim at defining outcomes and help students work towards these. These Regulations also envisage a broader role for trainees as scholars, researchers and specialists. In order to diversify experience, stimulate interest in research and discover learning beyond primary care, an opportunity has been created in the new MBBS program for the student to undertake electives of his or her choice subject to availability. Two months of elective time one each in the basic sciences or research and the other in clinical sciences or community clinics have been created. Leverage has been given to institutions to create these electives based on local circumstances and perceived need. Elective postings are compulsory for students and its successful completion is necessary for students to be able to attend the final examination.

This booklet is intended as a guide for institutions to plan the elective postings. Institutions are requested to provide the opportunity for students to take electives of their choice, if needed through external collaborations, if such opportunities are limited while following the guidelines mentioned in the Graduate Medical Education Regulations and this booklet. I would like to express my gratitude to the Academic Cell of MCI and the Expert Group whose constant guidance has helped in the successful roll out of the new curriculum.

Secretary General, MCI

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Curriculum Implementation Support Program

Module:

ELECTIVES

Electives

Introduction

The MBBS program is geared to create a primary care provider of first contact. It also visualises the student as a future scholar, specialist, researcher and scientist.

Provision of avenues in the competency based undergraduate MBBS program for the student to explore and experience various streams of the profession is important. Electives are learning experiences that will provide the learner with an opportunity to gain immersive experience of a career stream, discipline or research project.

The opportunity to “work” in a clinical, laboratory, research, community set up or in a team-based setting at an early stage in the profession is an invaluable experience for learners as this will have lasting impact on their professional life. An elective allows students to think of a career beyond examinations and gives them an impetus to think laterally besides laying down the foundation for future professional pathways. It also allows students to match their aspirations with the ground reality in a field of their dreams.

The revised Regulations on Graduate Medical Education, part II 2019 (GMER 2019) have created such opportunity in the MBBS program providing students options to do electives in basic sciences, join in ongoing clinical programs and in research settings. This document is meant to guide institutions, Curriculum Committee members and MEU faculty of colleges, and teachers on how to prepare and experience the conduct of an elective that incorporates the principles enshrined in the GMER document, 2019.

Objectives

The participant must be able to develop electives for block 1 and block 2 as envisaged in GMER 2019 document.

Glossary

Elective: An elective is a learning experience created in the curriculum to provide an opportunity for the learner to explore, discover and experience areas or streams of interest.

Block: is a defined time period during which learning experiences are created in a particular specialty, subject or theme.

Log Book: Is a *verified record* of the progression of the learner documenting the acquisition of the requisite knowledge, skills, attitude and/or competencies.

Portfolio: is a collection of the learner's progression in tasks and competencies. A portfolio is an evidence of events documented in the log book. It includes selected assignments, self-assessment, feedback, work-based and in-training formative assessments, reflections and learnings from planned activity in the curriculum.

Log books are thus linked to portfolios and may be included in the portfolio.

Definitions

An Elective is a learning experience created in the curriculum to provide an opportunity for the learner to explore, discover and experience areas or streams interest in the profession.

Curricular Element or Program addressed

Electives

Relevant extract from Regulations on Graduate Medical Education, Regulations on Graduate Medical Education (Amendment), 2019, part - II for MBBS course starting from academic year 2019-20 onwards

9.3. Electives

9.3.1 Objectives: To provide the learner with opportunities:

(a) For diverse learning experiences,

(b) To do research/community projects that will stimulate enquiry, self-directed, experiential learning and lateral thinking.

9.3.2 Two months are designated for elective rotations after completion of the examination at end of the third MBBS Part I and before commencement of third MBBS Part II.

9.3.3 It is mandatory for learners to do an elective. The elective time should not be used to make up for missed clinical postings, shortage of attendance or other purposes.

9.3.4 Structure

(a) The learner shall rotate through two elective blocks of 04 weeks each.

(b) Block 1 shall be done in a pre-selected preclinical or para-clinical or other basic sciences laboratory OR under a researcher in an ongoing research project. During the electives, regular clinical postings shall continue.

(c) Block 2 shall be done in a clinical department (including specialties, super-specialties, ICUs, blood bank and casualty) from a list of electives developed and available in the institution OR as a supervised learning experience at a rural or urban community clinic.

(d) Institutions will pre-determine the number and nature of electives, names of the supervisors, and the number of learners in each elective based on the local conditions, available resources and faculty.

9.3.5 Each institution will develop its own mechanism for allocation of electives.

9.3.6 It is preferable that the list of elective choices are made available to the learners in the beginning of the academic year.

9.3.7 The learner must submit a learning log book based on both blocks of the elective.

9.3.8 75% attendance in the electives and submission of log book maintained during elective postings is required for eligibility to appear in the final MBBS examination.

9.3.9 Institutions may use part of this time for strengthening basic skill certification.

Description of Curricular program

Two choices of electives are offered to medical students before the commencement of III MBBS part 2. For the purpose of this document these shall be called Block 1 and Block 2. The salient features of each block and their differences are summarised in Table 1.

Table 1: Salient features of Electives in Block 1 and Block 2

	Block 1	Block 2
When	Before commencement of IIIrd MBBS part 2	Before commencement of IIIrd MBBS part 2
Duration	4 weeks	4 weeks
Focus of electives	Pre-/para - clinical disciplines or in other basic sciences laboratory or join ongoing research programs	Clinical specialties or community clinics (rural or urban)
Nature of learning	Supervised Experiential Immersive Self-directed	Supervised Experiential Immersive Self-directed
Regular clinical postings	Will continue	Will not be offered
Attendance	Mandatorily 75% attendance is required as prerequisite to be allowed	Mandatorily 75% attendance is required as prerequisite to be allowed

	to take Part 2 summative examination	to take Part 2 summative examination
Assessment	Formative Record of activities in log book and portfolio (or annexure to log book) to be submitted as prerequisite to be allowed to take Part 2 summative exam	Formative Record of activities in log book and portfolio (or annexure to log book) to be submitted as prerequisite to be allowed to take Part 2 summative exam
Out of institution experience	Allowed (note clinical postings allowed to continue)*	Allowed within the city*
Out of city or state experience	Continuation of clinical postings makes this difficult	Allowed with due approval*

* See caveat in text

The primary purpose of block 1 is to provide the learner with research experience in basic sciences OR laboratory sciences OR in clinical sciences. The purpose of block 2 is to provide the learner an explorative experience with guided patient care in a specialty of choice.

Electives in both blocks will require planning and coordination by the institution, various departments involved and preceptors who will directly supervise and guide students. Coordination will also be required with external institutions, community clinics and preceptors as may be required for the conduct of electives.

1. Planning the learning experience

The first step in the process is to plan the learning experience. Given the diversity of blocks there will be some variation in the content style and degree of learning; however, each elective should have the following:

a. defined learning objectives,
b. an identified preceptor responsible for guiding the student,

c. a pre-published timetable of activities identified for the learner during the elective,
d. list of learning resources for the learner to be used during the elective,
e. provision to be part of the team to obtain an immersive learning experience,
f. prerequisites, if any, to be completed before joining the elective,
g. defined formative assessments with appropriate requirements for portfolio and log book entry, and
h. program evaluation by the stakeholders.

A template for planning learning experiences is provided in Table 2.

Examples of several kinds of learning experiences are found in annexure 1.

Table 2: Template for planning learning experiences in electives

Name of Block	
Name of Elective	
Location of hospital lab or research facility	
Name of internal preceptor(s)	
Name of external preceptor (if any)	
Learning objectives of the elective	
Number of students that can be accommodated in this elective	
Prerequisites for the elective	
Learning resources for students	
List of activities in which the student will participate	
Portfolio entries required	
Log book entry required	
Assessment	
Other comments	

2. Identifying learning experiences

To ensure that there is an immersive learning experience and greater attention to the learner, each preceptor identified must be tagged with only a minimum number of students. Therefore, it is important to identify a sufficient number of preceptors, laboratory positions, and existing research projects (for block 1) and specialties and community clinics, for block 2. Input from both faculty and students can be sourced to identify electives that are feasible and desired.

If required and feasible, collaboration with external resources including central and private research institutes and laboratories, hospitals and clinics can be done ensuring that the quality and principles outlined in section 1 are maintained. Student-initiated external rotations may be permitted as long as they do not violate institutional rules and conform with the broad principles outlined. Rotations outside the city will require prior permission from the Medical Council of India. Examples (neither exhaustive nor comprehensive) of block 1 and block 2 electives are provided in Table 3.

Table 3: Examples of Block 1 and Block 2 learning experiences

Block 1	Block 2
Laboratory Experience:	**Clinical Specialty Experience:**
Pathology	Emergency room
Microbiology, Virology	Intensive Care unit
Biochemistry	Psychiatry
Genetics	Adolescent Reproductive Health issues
Molecular biology	Neonatology
Immunology	Dermatology
Pharmaco-vigilance and clinical pharmacology	Health care quality and safety

Infection Control	Rehabilitation and palliative care
Community outreach experience	Sports medicine
Assisted living	Clinical Ethics
Hospice care	**Super-specialty experience**
School Health programs	Hematology
Community outreach for National Health Programs	Oncology
Maternal and child health outreach	Rheumatology
Research	Endocrinology and Diabetes
Student initiated research	Nephrology
Participation in faculty research	Neurosurgery
Community and epidemiologic surveys	Cardiology / Cardiac Surgery
Others	GI surgery
Bioinformatics / Tissue engineering	Organ Transplant Anesthesia
Computers and artificial intelligence in health care	**Urban or Rural community experience**
	Rural Community Health Center
	Primary Health Center
	Corporation health clinic
	Selected private primary care clinic

3. Student counseling and allocation of electives

The list of available learning experiences for each block and the names of preceptors for each should be available to students on the institutional notice board at least three months before the commencement of the electives. A process for submitting applications for both blocks with choices should be made available to

the students. Written information on each learning experience must be available for students to examine and make an informed choice.

A counseling session with faculty mentors to help students choose electives is desirable. The faculty mentors must ascertain a student's expectation from the electives he/she has chosen. Students must also be made aware of the rules regarding attendance, work schedule, documentation and assessment requirements for each elective. The allocation of electives may be done based on student choice and availability of rotation by faculty who have been identified to be in-charge of the electives program, for each block. The allocation must be done sufficiently in advance and the students informed so that the prerequisites for the electives, if any (such as knowledge training in good laboratory practices, good research practices, CPR training etc.) can be completed by the student. A process to identify the veracity of student initiated electives must be in place.

4. Student research

Block 1 may also be used by students under the guidance of a preceptor to complete funded (e.g. ICMR student grant, institutional grant etc,) or unfunded research projects. In addition, predefined work, monitoring, presentation and writing plan may be finalised by the learner and the preceptor, prior to starting the elective. Students may also participate in a pre-existing research project ongoing under the preceptor.

It is important to define the objectives, role of the student in the project and his or her part in the writing and publication or presentation of a part of the project. An assessment by the preceptor of the student’s role, contribution, involvement and performance must be made. Documentation of experiences, observations, reflections and presentations by the student may be added to the portfolio or as annexure to the log book. Appropriate log book entries that document the student participation and which are verified by the preceptor are critical for successful

completion of the work undertaken. Similar arrangements must be made if an external preceptor or institution is identified.

5. External institutions

Given the number of positions available in each elective and the need to provide a broad diverse experience for students, colleges can enter into agreements with external institutions within the country to accommodate students for undertaking an elective experience in both block 1 and block 2, as long as this is not in conflict with the rules and policies of the Medical Council of India, the college of the student and the institution identified and the conditions outlined above are complied with. Student-initiated external rotations may not be discouraged provided they meet the expectations of the program as outlined. Out of city/state experiences may be decided based on institutional policy (since clinical postings will continue during block 1, out of city programs may not be feasible here). Out of state electives in block 2 require prior permission from the Medical Council of India. Identifying suitable preceptors in the host institution and briefing them of the expectations and requirements of the program is important. A local preceptor or faculty who can liaise with the external preceptor will help to solve problems and ensure smooth conduct of the elective.

6. Student safety

In each of these electives especially in those involving external rotations, safety of the student should be paramount. Rotations in which the student may be exposed to potentially hazardous situations must be avoided. It must be made clear to the preceptors by the college authorities that students need to be supervised and must not be involved in patient care as the responsible health provider. When required, students must complete the prerequisite training such as good laboratory practice, universal precautions, good clinical practice etc. before being allowed to participate in electives. The student must be oriented to the program through a formal

orientation process that spells out the expectations/outcomes and the precautions to be observed.

7. Assessment

Assessment will be formative (refer to MCI module no. 3 on Assessment, for details). Attendance of not less than 75% and successful completion of items that require log book entry and their submission is a requirement for the student to become eligible to take the final examination. Assessment elements could include participation in grand rounds, seminars, case records, submission of assignments, reflection on learnings, preparation of abstracts for research posters, design and participation in patient education programs etc. The module on Log book available on the MCI Website may be consulted for further information.

8. Program evaluation

Provision for evaluation of the program based on information from all stakeholders should be made in order to evaluate the effectiveness of the program and need for modifications and improvement.

9. Curricular governance

The Curriculum Committee of the college constituted as per MCI norms and headed by the Dean of the college will be responsible for the design, conduct, implementation and evaluation of the elective program. The design and conduct of block 1 may be assigned to Phase 1 and Phase 2 subcommittees constituted by the Dean while that of block 2 may be assigned to Phase 2 Sub-committee. The departmental heads and preceptors are responsible for the day-to-day conduct of the program, guiding and supervising and assessing students.

Annexure 1

1. Example of a learning experience in block 1

Table 4: Example of a block 1 learning experience

Name of Block	Block 1
Name of Elective	Medical Genetics
Location of hospital Lab or research facility	Medical College hospital
Name of internal preceptor(s)	Name/s
Name of external preceptor (if applicable)	N/A
Learning objectives of elective	1. to demonstrate the conduct of commonly available genetic tests in a controlled environment 2. to enumerate indications for common genetic tests 3. To enumerate the testing protocol for commonly performed genetic tests 4. to demonstrate the correct method to perform a karyotype 5. to present a genetic history and determine the nature of inheritance of a given condition
Number of students that can be accommodated in this elective	4
Prerequisites for elective	Necessary immunisations, Universal precaution certification
Learning resources for students	Departmental handbook provided
List of activities of student participation	1. Work daily with a supervisor in observing, assisting and performing genetic tests 2. Participate in departmental education activities 3. Present at least two tests done by student as a case work up

Portfolio entries required	1. Documentation of worked up cases 2. Documentation of presentation done
Log book entry required	Completion of posting signed by preceptor with a “meets expectation ‘(M)’ grade”
Assessment	**Formative:** attendance; day-to-day participation in departmental activity; performance of assigned tasks and presentation of worked up case in department
Other comments	

2. Example of a learning experience in block 2

Table 5: Example of a block 2 learning experience

Name of Block	Block 2
Name of Elective	Diabetology
Location of hospital Lab or research facility	Medical College hospital
Name of internal preceptor(s)	Name/s
Name of external preceptor if applicable	N/A
Learning objectives of elective	1. To provide care for patients with diabetes in a supervised environment 2. To function effectively as a team member in a multidisciplinary team managing diabetes 3. To counsel patients about diabetes care appropriately 4. To describe the pathophysiological clinical correlates as they apply to care of patients with diabetes
Number of students that can be accommodated in this elective	6
Prerequisites for elective	Must have received necessary immunisations, Basic Life Support training
List of activities of student participation	1. Participate in OP and IP rounds 2. Participate in afternoon teaching sessions of the department 3. Present at least two cases that are fully worked up in the teaching session 4. Participate in patient education and multidisciplinary team meetings 5. Participate in audit meetings
Learning Resources	Seshadri K: Clinician's handbook of diabetes

Portfolio entries required	**Assignments provided** Two worked up case records that have been presented Documentation of self-directed learning as summary and reflection
Log book entry required	Satisfactory completion of posting by a preceptor with a “meets expectation ‘M’ grade”
Assessment	Attendance **Formative:** Participation in OP & IP rounds and team activities, Presentation of worked up cases, Documentation of attendance and required portfolio and log book entries
Other comments	

3. Example of a research rotation in block 1

Table 6: Example of a research learning experience in block 1

Name of Block	Block 1
Name of Elective	Research (Preceptor initiated)
Location of hospital Lab or research facility	Medical College hospital
Name of internal preceptor(s)	Name
Name of external preceptor	N/A
Learning objectives of elective	1. To collect data as prescribed in the protocol 2. To document data in the electronic case record correctly 3. To demonstrate the use of statistical software to do basic research calculations 4. To write an abstract based on the collated data 5. To present abstract to a group of peers and supervisors
Number of students that can be accommodated in this elective	4
Prerequisites for elective	Good clinical practice, Good laboratory practice
List of activities of student participation	1. Work with supervisor in making observations, collect data and document as per protocol 2. Work with statistician to provide a statistical analysis of the data 3. Participate in research meetings of the department, internal and external meetings 4. Write abstract of work done 5. Present abstract in an internal meeting and if possible at an external meeting as a poster or oral presentation

Learning Resources	Sackett DL: Clinical epidemiology Robbins & Cotran Pathological basis of disease
Portfolio entries required	Laboratory notes Statistical work sheet Abstract created
Log book entry required	Satisfactory completion of posting with a “meets expectation ‘(M)’ grade”
Assessment	Attendance Successful completion of research objectives and log book entry
Other comments	

4. Example of an external rotation in block 2

Table 7: Example of a community clinic rotation in block 2

Name of Block	Block 2
Name of Elective	Community Clinic
Location of hospital Lab or research facility	Primary health care center in (name of) a village
Name of internal preceptor(s)	Name
Name of external preceptor if applicable	Name
Learning objectives of elective	1. To provide primary care to patients in a resource limited setting under supervision 2. To function as a member of a health care team in a primary care center 3. To participate in health outreach activities of a primary care center
Number of students that can be accommodated in this elective	6
Prerequisites for elective	Required immunisations to be taken, BLS, Basic Suturing and first aid
List of activities of student participation	1. Provide patient care under the supervision of a community clinic preceptor 2. Assist in common procedures in a community care clinic 3. Counsel patients in their own language 4. Participate in national health care programs offered through the PHC 5. Participate in team meetings of the PHC
Learning Resources	The Washington Manual of Medical Therapeutics, 2019

Portfolio entries required	Daily log of patients seen and activities participated At least 04 fully worked up patients to be documented
Log book entry required	Satisfactory completion of posting by external preceptor co-signed by institutional preceptor
Assessment	Attendance Successful verification of required portfolio entries, Successful completion of the posting as certified in the log book with a “meets expectation ‘M’ grade”
Other comments	

5. Example of a block 1 rotation in emerging infections

Table 8: Example of a learning experience in block 1 in virology

Name of Block	Block 1
Name of Elective	Emerging viral infections
Location of hospital Lab or research facility	Medical college hospital
Name of internal preceptor(s)	Name
Name of external preceptor if applicable	N/A
Learning objectives of elective	1. To obtain experience in the laboratory investigation of viral outbreaks 2. To obtain experience in diagnostic testing in viral diseases
Number of students that can be accommodated in this elective	6
Prerequisites for elective	Universal precautions and Good laboratory practice modules to be completed
List of activities of student participation	1. Participate in laboratory activities including sample processing, sequencing RT PCR viral cultures etc. 2. Participate in academic programs of the department 3. Write up the laboratory work up of two patients with viral illness 4. Visit to a center with electronic or confocal microscope 5. Present at least two cases in departmental academic forum
Learning Resources	Handbook of Virology testing
Portfolio entries required	Lab Notes and work book entries; Presentations done

Log book entry required	Satisfactory completion of posting authenticated by preceptor
Assessment	Attendance Successful verification of required portfolio entries, Successful completion of the posting as certified in the log book with a “meets expectation ‘M’ grade”
Other comments	

6. Example of a block 2 rotation in emerging infections

Table 9: Example of a learning experience in block 2 in virology

Name of Block	Block 2
Name of Elective	Clinical infectious disease and virology
Location of hospital Lab or research facility	Medical college hospital
Name of internal preceptor(s)	Name
Name of external preceptor if applicable	N/A
Learning objectives of elective	1. To function as part of an infectious disease team 2. To be able to approach and investigate infection outbreaks 3. Get hands on experience on contact tracing, community isolation measures, and use of technology 4. To understand the principles of the management of viral infections
Number of students that can be accommodated in this elective	6
Prerequisites for elective	Universal precautions and must have taken required immunizations; CPR training
List of activities of student participation	1. Participate in inpatient and outpatient team rounds 2. Participate in community outbreak investigations 3. Counsel patients on correct precautions during outbreaks 4. Diagnose and understand the principles in the management of viral diseases 5. Liaise with the laboratory in the diagnosis 6. Present at least one patient or outbreak investigation in the departmental meeting

Learning Resources	Handbook of clinical virology
Portfolio entries required	Case record of at least one patient Record of patient counseling session or contact tracing done
Log book entry required	Satisfactory completion of posting by preceptor
Assessment	Attendance, Successful verification of required portfolio entries, Successful completion of the posting as certified in the log book with a “meets expectation ‘M’ grade”
Other comments	

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COMPETENCY BASED UNDERGRADUATE CURRICULUM FOR THE INDIAN MEDICAL GRADUATE

Knows → Knows how → Shows → Shows how → Performs

Observe

Demonstrate

Enumerate

Assist

Counsel

Describe

Prescribe

Analyse

Integrate

Guide

Communicate

Correlate

Interpret

Module 1

Foundation Course

Critique

Collaborate

Clinician Communicator Team Leader Professional Lifelong Learner

Knowledge | Skills | Attitude | Values | Responsiveness | Communication

Curriculum Implementation Support Program

Foundation Course for the Undergraduate Medical Education Program

2019

Medical Council of India
Pocket-14, Sector-8, Dwarka,
New Delhi 110 077

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FOREWORD

Medical education and educators have the responsibility of training the custodians of the health of the nation. The MBBS program is the foundation of the health delivery system in the country creating health care providers who need to provide not only adequate, appropriate and cost effective care but also need to be leaders of their community. Through the program it is expected that students will be able to fulfill their professional and personal goals and aspirations in addition to the expectations of the profession, society and nation. The course can be demanding and requires the learner to respond to the challenges of continued learning and improvement. Besides acquisition of new skills, learner is required to provide leadership in challenging situations and demonstrate exemplary professional and humanistic attributes. Medical students come from varied backgrounds and require a bridge that will transition from school to a professional course.

The Board of Governors in supersession of Medical Council of India has therefore created a Foundation Course that will not only serve as a bridge for the student into the MBBS program but will also orient the student to the knowledge, skills and attitude required of him or her during the program. The Foundation Course is envisaged to be a month long program with continued support provided through the year for students to acquire language, communication and computer skills. Particular emphasis on professional and ethical behaviour is placed in the Foundation Course; this dovetails into the AETCOM module - one of the flagship programs of the MBBS curriculum.

This booklet has been developed by experts and is meant to be used as a program guide for the Foundation Course. It outlines the outcomes that are intended to be achieved; it also incorporates examples of the Foundation Course program derived from best practices from around the country. Institutions are encouraged to develop their own Foundation Course that addresses local needs and brings out the institutional flavour while aligning the whole program to the outcomes identified in the booklet. The Medical Council of India also welcomes institutions to share their learning feedback and best practices that will enhance the value and structure of the program in the coming years.

The Council is grateful to the experts who have developed this booklet for their time and effort. Appreciation is also due to the Academic Cell and the members of expert group headed by Dr. Avinash Supe under whose guidance the course and the competency based curriculum has been developed and is being progressively rolled out in the country.

(Dr. V. K. Paul)

डॉ. राकेश कुमार वत्स
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Secretary General

सत्यमेव जयते

भारतीय आयुर्विज्ञान परिषद
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Foreword

India has the unique distinction of having the largest number of medical schools since it has taken the responsibility to create a large pool of health educators who would be responsible to train the young Indian Medical Graduate joining the undergraduate medical education program. The MBBS program is the foundation of the health delivery system in the country, creating health care providers who need to provide not only adequate, appropriate and cost effective health care but also need to be leaders of their community, in due course. Medical students in India come from diverse backgrounds in terms of geography, culture, language, economy, social construct, medium of instruction and education Boards. The MBBS course is a highly challenging programwhich prepares the student for a lifetime of altruistic care, continued learning, discipline, professional and ethical behavior and respect for human interactions, systems and processes. It is therefore necessary that a smooth transition of the high school student to this challenging learning stream is ensured and to achieve this, a Foundation Course at the beginning of the MBBS program was considered necessary.

This booklet has been developed by Council-nominated experts and is meant to be used as a program guide for the Foundation Course; institutions are encouraged to develop their own format of the Foundation Course that addresses local needs while aligning the whole program to the outcomes identified in the booklet. The Foundation Course is the forerunner to the roll out of the competency based UG curriculum across the country under the aegis of the Medical Council of India & Board of Governors.

The Council is grateful to the Expert group who have developed this booklet for their valuable time, knowledge, expertise and effort ably supported by the Academic Cell of the Council.

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Secretary General

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Curriculum Implementation Support Program

Module – 1

FOUNDATION COURSE

FOUNDATION COURSE

Objective of the document

The objective of this document is to facilitate institutions and faculty in implementing a **Foundation Course** of one-month duration at the beginning of the MBBS course that will sensitise the fresh medical student with the required knowledge and skills that will assist him/her in acclimatising to the new professional environment which would be his/her milieu for a life-long career in the medical profession. The Foundation Course will ~~also~~ provide a sound foundation for learning in the MBBS course and later in their professional career. While the institutions are expected to abide by the general guidelines, local changes can be made depending on the context and requirements.

1. Glossary of terms used in the document

Orientation: Refers to the awareness created in new students with respect to place (learning environment and facility), time, teaching schedules and timetables, processes (Rules, Regulations, policies and procedures), personnel (faculty, staff, and mentors), patients and their relatives.

Skills Module: Refers to basic skills that are considered important for all health care personnel who deal with patients and requires students to be trained in prior to entering patient care areas.

Enhancement skills: Refers to those skills which are needed to enable students from diverse backgrounds (including different Boards, language of instruction, culture and varied degrees of technological exposure) to appreciate and accommodate the similarities and differences in medical practice and to feel at par with each other.

Sports and extra-curricular activities: Refers to sports and extra - curricular activities permitted within the time schedule.

Professionalism and ethics: Professionalism defines a set of values and behaviour that build the trust that a patient has in his/ her doctor. Ethics are principles that govern the behaviour of doctors. Professional competence, effective communication and ethics are the three founding principles of Professionalism.

2. Introduction

Medical education in India requires training in a wide spectrum of domains that involves exposure to human interactions and interpersonal relationships in various settings including hospital, community, clinics etc. The training is intense and demands great commitment, resilience and lifelong learning. Students enter a new environment in medical college at around 17 years of age directly from school which can be challenging. Therefore, it is desirable to create a period of acclimatisation and familiarization to the new environment. This would include an introduction to the course structure, learning methods, technology usage, and peer interactions which would facilitate their smooth transition from high school to medical college.

This is proposed to be achieved through a dedicated one month exclusive "Foundation Course", at the beginning of the MBBS course, to orient and sensitize the student to the various identified areas. Many of these identified areas will need to be followed up by more focused outcome-based sessions at various stages in the MBBS course. This will be achieved through activities/small courses integrated throughout the course which will be like the thread running through a garland. At appropriate stages throughout the course, emphasis will be laid on the various essential roles of the "Indian Medical Graduate".

3. Purpose

The purpose of the Foundation Course include:

a) Orienting the students to all aspects of the medical college environment.
b) Equipping them with certain basic, but important, skills required for patient care and enhancing their communication, language, computer and learning skills.
c) Providing opportunity for peer and faculty interactions and an overall sensitisation to the various learning methodologies.

4. Context from proposed GMER 2019 (Graduate Medical Education Regulations)

9.1. Foundation Course

Goal: The goal of the Foundation Course is to prepare a learner to study Medicine effectively. It will be of one-month duration after admission (see Table 1).

9.1.1 **Objectives:** The objectives are to:

(i) Orient the learner to:

a. The medical profession and the physician's role in society
b. The MBBS programme
c. Alternate health systems in the country and history of medicine
d. Medical ethics, attitudes and professionalism
e. Health care system and its delivery
f. National health priorities and policies
g. Universal precautions and vaccinations
h. Patient safety and biohazard safety
i. Principles of primary care (general and community-based care)
j. The academic ambience

(ii) Enable the learner to acquire enhanced skills in:

a. Language
b. Interpersonal relationships
c. Communication
d. Learning including self-directed learning
e. Time management
f. Stress management
g. Use of information technology

(iii) Train the learner to provide:

a. First-aid
b. Basic life support

9.1.2 In addition to the above, learners may be enrolled in one of the following programmes which will be run concurrently:

(i) Local language programme
(ii) English language programme

(iii) Computer skills

These may be done in the last hours of the day for the duration of the Foundation Course.

9.1.3 These sessions must be as interactive as possible.

5. Major Components

The major components of the Foundation Course include:

- **Orientation Program:** This includes orienting students to all the components mentioned in GMER 9.1 and should be completed as one block in the first week.
- **Skills Module (Basic):** This involves skill sessions such as Basic Life Support, First Aid, Universal precautions and biomedical waste and safety management that students need to be trained prior to entering the patient care areas.
- **Field visit to Community and Primary Health Centre:** These visits provide orientation to the care delivery through community and primary health centres, and include interaction with health care workers, patients and their families.
- **Professional development including Ethics:** This is an introduction to the concept of Professionalism and Ethics. This component will provide students with understanding that clinical competence, communication skills and sound ethical principles are the foundation of professionalism. It will also provide understanding of the consequences of unethical and unprofessional behaviour, value of honesty, integrity and respect in all interactions. Professional attributes such as accountability, altruism, pursuit of excellence, empathy, compassion and humanism will be addressed. It should inculcate respect and sensitivity for gender, background, culture, regional and language diversities. It should also include respect towards the differently abled persons. It introduces the students to the basic concept of compassionate care and functioning as a part of a health care team. It sensitises students to “learning” as a behaviour and to the appropriate methods of learning.

Orientation to Professionalism and Ethics will continue as the AETCOM module after the first month of the MBBS course and throughout the first year, with reinforcement of the various components introduced.

- **Sports and Extracurricular activities:** These have been included, in order to demonstrate the importance of work-life balance in a demanding profession, and provide an opportunity for students to have compulsory physical activity and to showcase their talents. The Foundation Course should have compulsory 4 hours

per week for sports and 2 hours per week for extracurricular activities, adding up to 22 hours.

- **Enhancement of Language / Computer skills / Learning Skills:** These are sessions to provide opportunity for the students from diverse background and language competence to undergo training for speaking and writing English, fluency in local language and basic computer skills. The students should be sensitized to various learning methodologies such as small group discussions, skills lab, simulations, documentation and concept of Self-Directed learning.

Structure of the program for students

Table.1

Subjects/ Contents	Total Teaching hours
Orientation[1]	30
Skills Module [2]	35
Field visit to Community Health Centre	8
Professional Development including ethics	40
Sports and Extracurricular activities	22
Enhancement of language/ computer skills[3]	40
Total teaching hours	175

1. Orientation course will be completed as single block in first week and will contain elements outlined in the section 9.1.1of the GMR
2. Skills modules will contain elements outlined in the section 9.1.1 of the GMR
3. Based on perceived needs the students may choose any or both of language enhancements (English or local spoken or both) and computer skills. This should be available longitudinally throughout the duration of the Foundation Course and afterwards.

Foundation Course will be organized by co-ordinator appointed by Dean of the college and will be under supervision by the heads of preclinical departments.

Foundation Course Modules

1. Orientation Module — **Total hours: 30**
   - 1A. Orientation Module: Introduction to institution / campus / facilities
   - 1B. Orientation Module: Role of doctors in the society
   - 1C. Orientation Module: History of Medicine and alternate systems
   - 1D. Orientation Module: IMG roles / overview MBBS curriculum various career pathways
   - 1E. Orientation Module : Principles of family practice
2. Skills Module: — **Total hours: 35**
   - 2A.Skills Module: First Aid
   - 2B.Skills Module: BLS
   - 2C.Skills Module: Universal precautions
   - 2D.Skills Module: Waste management
   - 2E.Skills Module: Immunization
   - 2F.Skills Module: Documentation
3. Community orientation module — **Total hours: 8**
   - 3A. Community Orientation Module: National Health goals and policies/ health Care systems/ community health
   - 3B. Community Orientation Module: Interactions with patients and families, Communities.
4. Professional Development and Ethics Module (P&E) — **Total hours: 40**
   - 4A. (P&E): Concept of Professionalism and Ethics
   - 4B. (P&E): White coat Ceremony
   - 4C. (P&E): Professional behaviour and altruistic behaviour
   - 4D. (P&E): Working in a health care team
   - 4E. (P&E): Disability competencies
   - 4F. (P&E): Cultural competence
   - 4G. (P&E): Stress management
   - 4H. (P&E): Time management
   - 4I. (P&E): Interpersonal relationship
   - 4J. (P&E): Learning
5. Enhancement of Language and Computer Skills Module — **Total hours:40**
   - 5A.Enhancement of Language and Computer Skills Module: Communication
   - 5B.Enhancement of Language and Computer Skills Module: Local Language training
   - 5C. Enhancement of Language and Computer Skills Module: English Language training
   - 5D.Enhancement of Language and Computer Skills Module: Computer Skills training
6. Sports and extracurricular activities: — **Total hours: 22**

Sports should be for a mandatory 4 hours per week and extra-curricular activities 2 hours per week, subject to a total of 22 hours.

6. Learning outcomes

Code	COMPETENCY The student should be able to:	Domain	K/KH/ SH/P
1.	Topic : ORIENTATION		
FC 1.1	Demonstrate understanding of the role of doctors in the society and their impact	A	KH
FC 1.2	Demonstrate understanding of the Roles of an Indian Medical Graduate and relate it to the societal impact	A	KH
FC 1.3	Discuss and appreciate the expectations of the students from the Nation, society, Institution, peers, colleagues and patients and vice versa	A	KH
FC 1.4	Demonstrate understanding of the rules and regulations of the institution	A	SH
FC 1.5	Orient themselves to the college campus, facilities, faculty, administrative structure, support systems and processes of the institution	A	KH
FC 1.6	Discuss the various career pathways and opportunities for personal growth	A	KH
FC 1.7	Demonstrate understanding of the overview of MBBS curriculum, its structure and outcomes and its relation to the career pathways	K	KH
FC 1.8	Demonstrate understanding the role of physician at various levels of Health care delivery	K	KH
FC 1.9	Discuss the principles of family practice	K	KH
FC 1.10	Demonstrate awareness of the History of Medicine and alternate systems of Medicine	K	K
2	**Topic : Skills**		
FC 2.1	Perform Basic Life support in Skills lab	S	SH
FC 2.2	Perform First Aid in a simulated environment	S	SH
FC 2.3	Follow bio-safety and universal precautions	S	SH
FC 2.4	Demonstrate handling and safe disposal of Biohazardous materials in a simulated environment	S	SH
FC 2.5	Demonstrate proper hand washing and use of personal protective equipment	S	SH

FC 2.6	Demonstrate appropriate response to needle stick injuries	S	SH
FC 2.7	Demonstrate Biomedical Waste segregation (BMW), observe and explain the process of management of BMW in accordance with National Regulations	S	SH
FC 2.8	Discuss the Immunization requirements of Health care professionals	K	KH
FC 2.9	Demonstrate awareness of significance of documentation in patient care and the proper method of documentation	S	SH
3	**Community Orientation and field visits**		
FC 3.1	Demonstrate understanding of the National Health Goals and Policies	K	KH
FC 3.2	Discuss the national health scenario, demographic, socio-cultural and epidemiological issues	K	KH
FC 3.3	Demonstrate understanding of the health care systems in India with reference to primary, secondary and tertiary level care	K	KH
FC 3.4	Discuss the basic principles of community health and its impact on health and disease	S	SH
FC 3.5	Demonstrate understanding of the structure and functioning of the community health center	K	KH
FC 3.6	Demonstrate ability to obtain patient experiences through patient and family interactions and relate these experiences to impact of environment and diseases.	S	SH
4	**Professional Development including Ethics**		
FC 4.1	Demonstrate understanding of the concept of Professionalism and ethics among health care professionals and discuss the consequences of unprofessional and unethical behavior	S	KH
FC 4.2	Demonstrate understanding that compassion, altruism, integrity, duty, responsibility and trust are the core values that defines the nature of the physician's work	K	KH
FC 4.3	Discuss the value, honesty and respect during interaction with peers, seniors, faculty, other health care workers and patients	S	KH

FC 4.4	Discuss the significance of working in a health care team	S	KH
FC 4.5	Discuss disability competencies	K	KH
FC 4.6	Demonstrate understanding and respect of cultural diversities and interact with those with different cultural values	K/A	KH
FC 4.7	Discuss the significance and methods of stress management and risk taking behavior.	K	KH
FC 4.8	Understand the role of Yoga and meditation in personal health	S	S
FC 4.9	Discuss the significance and appropriate ways of Time management	K	KH
FC 4.10	Demonstrate understanding of importance of interpersonal relationship while working in a health care team	S	KH
FC 4.11	Understand the role of mentoring	S	KH
FC 4.12	Demonstrates understanding of the process of group learning and group dynamics	S	KH
FC 4.13	Comprehend the learning pedagogy and its role in learning skills	S	KH
FC 4.14	Demonstrates understanding of different methods of self-directed learning	S	KH
FC 4.15	Understand collaborative learning	S	KH
5	**Enhancement skills - Communication and language skills**		
FC 5.1	Demonstrate ability to communicate with patient and families, be aware of barriers to communication and appropriate ways to respond	C	SH
FC 5.2	Demonstrate use of local language in patient and peer interactions	C	SH
FC 5.3	Demonstrate ability to communicate and learn in English	C	SH
FC 5.4	Demonstrate basic computer skills	S	SH
FC 5.5	Demonstrate ability for accessing online resources	S	SH

7. Formative and Internal Assessment

- Foundation Course is compulsory and an attendance of 75% will be mandatory
- Feedback, comments and/or grades about the student's performance by the faculty mentor can be documented particularly for the skills training
- The performance of the students in the Foundation Course will **NOT** contribute towards internal assessment marks.
- Student's feedback about the Foundation Course also needs to be documented in a structured format. This will help in gathering student's perceptions about various aspects of Foundation Course and help in program evaluation and refinement.

8. Capacity Building for Faculty

The components of the Foundation Course are multifarious and will require resource faculty from various disciplines. Many of these identified areas of the Foundation Course will need to be followed up by more focused outcome-based sessions at various stages in the course of MBBS through activities spirally integrated throughout the course. The objectives of each of the sessions in the Foundation Course are specific and the resource faculty need to understand not only the content, context and specific objectives of these sessions but also the approach and need for an interactive teaching learning methodology. The Dean/Principal of every medical college will ensure that adequate faculty training and resources are made available for implementation of the Foundation Course.

9. Curricular Governance and Evaluation

The Dean/ Principal in each medical college will identify **a faculty coordinator from preclinical departments** for conduct of the Foundation Course.

The faculty coordinator will identify resource faculty for the various sessions from within and outside the institution and coordinate the training of the resource faculty, the implementation of the program and the evaluation of the program.

Program evaluation report from faculty and students will be submitted to curriculum committee within four weeks of completion of Foundation Course.

Annexures

(The following are examples of schedules and lesson plans that may be used for Foundation Course. Institutions are encouraged to make their own plan tailored to their local needs and aligned to proposed outcomes)

		Mon	Tue	Wed	Thu	Fri	Sat	Sun
Week 1	Morning	1A	1B	1C	1D	1E	2F	
	After noon	1A	1B 6A	1C 6A	1D 6A	1E 6A		
Week 2	Morning	2B	2A	2C	2D	2E	6B	
	After noon	2B	2A 6A	2C 6A	2D 6A	2E 6A		
Week 3	Morning	3A	4A	4C	4D	4G	4F 6B	
	After noon	3B	4A 6A	4C 6A	4D 6A	4E 6A		
Week 4	Morning	4H	4J	5A	5D	5D	5B 6B	
	After noon	4I	5B 6A	5B 6A	5B 6A	5B 6A		
Week 5	Morning	5D	5C	5C				
	After noon	5B	5C	4B				

Sample lesson plans

1. Orientation

The purpose of the Orientation Module is to provide the new MBBS student a greater understanding of the medical profession in a historical, local and national context, a knowledge of the institution in which he/she will spend the next six years, and an idea of his/her role as an MBBS student.

1A Orientation Module: Introduction to institution / campus / facilities

The medical students at the very beginning of their course should have a clear understanding of the goals of their training, the expectations of the nation, the vision and mission of the institution, Rules and Regulations of the organisation. They must also be provided an orientation to the campus and the facilities available.

FC 1.2	Demonstrate understanding of the Roles of an Indian Medical Graduate and relate it to the societal impact	A	KH
FC 1.3	Discuss and appreciate the expectations of the students from the nation, society, Institution, peers, colleagues and patients and vice versa	A	KH
FC 1.4	Demonstrate understanding of the rules and regulations of the institution	A	SH
FC 1.5	Orient themselves to the college campus, facilities, faculty, administrative structure, support systems and processes of the institution	A	KH

Objectives:

At the end of the session the students should be able to:

- Explain the Roles of the Indian Medical Graduate
- Discuss their expectations from the Nation, institution, society, colleagues and peers and vice versa
- Understand the Rules and Regulations of the Institution

- Familiarise themselves with the college campus, facilities, administrative structure, support systems and processes of the institution

Methodology

No.	Content area	Methodology	Time
1	Welcome and Introduction by institutional heads	Inspiring talk… to the new MBBS graduates and their parents	2 hours
2	Vision / Mission of the institution		
3	Roles of an Indian Medical Graduate		
4	Expectation of the students from Nation, Society, Institutions, colleagues and peers	Overview lecture/ interactive discussion	1 hour
4	Rules and Regulations of the institution	Overview lecture/ interactive discussion	1 hour
5	Orientation to the college / campus / facilities	▪ Walk through the college including lecture halls, common rooms, preclinical departments, office of the Dean and administration, library, food facilities, security facilities, auditorium – ▪ mini talks at important facilities regarding Rules and Regulations	4 hours
6	Introduction to faculty / mentors	Interactive session with faculty mentors and peers	2 hours

Assessment: Open feedback at the end of the Foundation Course

1B. Orientation Module: Role of doctors in the society

It is important for new entrants to the new MBBS program to have a clear understanding of the roles and responsibilities of a doctor in society and the expectations from society, patients and the profession. It is important to sensitise and inspire students to the wider roles of physicians in society beyond patient-doctor interaction.

FC 1.1	Demonstrate understanding of the role of the doctors in the society and their impact	A	KH

Objectives:

At the end of this session, the student will be able to:

1. Appreciate the wider role of physicians in society beyond the physician – patient interaction
2. Reflection their own potential roles in society

At the end of this session, the moderators will be able to:

1. Better understand the attitude of students who join the medical course regarding their perceptions of the social role of physicians
2. Review the session and make plans for:
    a. Further sessions
    b. The session next year

Methodology

No	Sub session	Methods	Requirements	Time
1	**Introduction**	Moderators, observers and other participants		10 minutes
2	Role of doctors buzz groups	• Create buzz groups of 10 students each • Ask each group to list, discuss and note down on separate cards the various roles of doctors • After 10 minutes, ask one student from each batch to bring up their cards to put on four different posters which will be labelled at the back as – diagnostic role, treating role, physician-patient interactive roles, societal role. ▪ The students will be blinded to labels at the back of poster. The moderator will help them separate and place their cards. • At the end, the entire group will view the posters – the moderator will turn the posters around to show the poster titles at the back The discussion that follows will be based on the	10 cards per group i.e. 150 cards Felt pens 04 large black poster sheets A4 white paper – for notes and observations	30 minutes

		nature of responses: • Do the students see the doctor within a constrained role? • Is there a societal role for doctors in all conditions? – is there an even greater relevance in a diverse, unequal society like India • Is there a possibility that doctors remove themselves from society – us (ivory tower) AND them – the concept of isolationism and the 'urban citadel'		
3	Short film	**Short film: In Silence – maternal mortality in India** Discussion: • Is this a medical problem or are there wider problems? • If there are wider problems, what are they? • What can doctors do to address wider problems? • Do doctors have privileged roles in society	LCD projector with adequate sound facilities	30 minutes

		that they can exploit for greater common good?		
4	Meet the doctor	**Meet the doctor:** Three doctors with diverse backgrounds who have chosen wider roles in society: They introduce themselves and their work **Interview them:** • Why did they choose this option? • What were the choices that they had to make? • What challenges did they face? • What advice, if any, would they give to these students?	Arrange chairs for visitors to face the students	6o minutes
5	Wrap up	Wrap up: Each student gets one card. • Think of one social issue in your own local area. • What could you do to help address that issue?	150 cards 4 black poster sheets 60 brief feedback questionnaires	30 minutes

		Students stick it on a poster entitled – • I AM PART OF SOCIETY – I CAN CONTRIBUTE TO IT • Time for entire batch to review what has been put up- • Which of the sessions did you like the most & why?		

Alternative method

No	Sub Session	Methods	Requirements	Time
1	Introduction	An interactive lecture to discuss • the roles of a physician and the expectation from the patient, families and society. followed by small group discussion Videos / clippings relating to the roles of the doctor could also be used as a trigger for discussion	LCD projector, audio output for video, Appropriate Video clips, Flip charts, Marker pens	1 hour
2	Shadowing the physician	Students asked to shadow Physicians and • observe patient- physician interaction and their expectations from doctors		2 hours
3	Reflection	Small group discussion and reflection		2 hours
4	Wrap up	Summarize salient points		10 minutes

Assessment: Formative: May be assessed by active discussion in the small group session or by Reflective writing in log book.

1C.Orientation Module: History of Medicine and alternate systems

Students at the time of entry into MBBS must be introduced to the evolution of the system of medicine which they will be learning and appreciate the great men and women behind many of the seemingly mundane practices and concepts in modern medicine. The students should also be introduced to the alternative systems that are available and how they can impact patient preferences and choices.

FC 1.10	Demonstrate awareness of the History of Medicine and alternate systems of Medicine	K	K

Objectives

At the end of the session, the students should be able to:

1. Discuss the History of Medicine
2. Distinguish Alternative Medicine, Complementary Medicine and Evidence based Medicine
3. Discuss the various Alternative Medicine practices in India and its practice impact

Methodology

No	Sub Session	Methods	Requirements	Time
1	Overview	lecture/ interactive discussion	LCD projector, Flip charts, Marker pens	30 minutes
2	Group work	Students, split into groups, are given a structured task on • obtaining information on one important aspect of the History of Medicine (example – evolution of the germ	History of Medicine hand outs	3 hours

		theory of medicine, discovery of vaccines,…etc) Small group discussion and reflection Presentation by groups and discussion		
3	Alternate systems of Medicine	lecture/ interactive discussion to address the following questions • What is Alternative Medicine? • What is Complementary Medicine? • What is Evidence Based Medicine? • What is the difference between Modern Medicine and Complementary and Alternative Medicine (CAM)? • What is the practice impact?	LCD projector, Flip charts, Marker pens	1 hour
3	Wrap up	Summation and learning points		10 minutes

Assessment: General feedback about the usefulness of the session for future planning

1D. Orientation Module: IMG roles / overview of MBBS curriculum and various career pathways

It is important for medical students at entry to have an overview of the curricular frame work and the expected learning outcomes from them. It is very important for them to know their career path and the road ahead.

FC 1.2	Demonstrate understanding of the Roles of an Indian Medical Graduate and relate it to the societal impact	A	KH
FC 1.7	Demonstrate understanding of the overview of MBBS curriculum, its structure and outcomes and its relation to the career pathways	K	KH
FC 1.6	Discuss the various career pathways and opportunities for personal growth	A	KH

The objectives

At the end of the session, the students should be able to:

- Comprehend the overall Goal and outcomes of the MBBS program
- Reflect on the various Roles of the Indian Medical Graduate
- Discuss the structure of the MBBS program
- Recognise the various career pathways that are available for their Career growth

Methodology

No	Sub Session	Methods	Requirements	Time
1	GMR 2019	Lecture/ interactive discussion about the salient features of the GMR 2019 • Explain the MBBS curriculum, its structure, outcomes and curricular requirements for course completion and program certification	LCD projector, Flip charts, Marker pens GMR 2019 handouts	1 hour
2	Panel discussion	A panel of specialists and physicians from diverse career pathways • Discuss the opportunities for the students followed by a question answer session. This could be done by the Alumni from various career back grounds		2 hour
3	Wrap up	Summation and learning points		10 minutes

Assessment: General feedback about the usefulness of the session for future planning

1E Orientation Module: Principles of family practice

The students need to be provided a basic understanding of the concept of family practice and holistic care. It is also important for the student to understand the role of the family practitioner in the health system, the role they could play at the various levels of health care.

FC1.8	Demonstrate understanding the role of physician at various levels of Health care delivery	K	KH
FC 1.9	Discuss the principles of family practice	K	KH

Objectives:

At the end of this session, the student will be able to:

1. Discuss the principles of family practice and holistic care
2. Describe the role of the physician in the health care system

Methodology

No	Sub Session	Methods	Requirements	Time
1	Principles of family practice and holistic care	Lecture/ interactive discussion about the ten principles of family practice: ▪ Caring ▪ Clinical Competence ▪ Cost-effectiveness ▪ Continuity of care ▪ Comprehensive care ▪ Common problems management expertise	LCD projector, Flip charts, Marker pens Case vignette or a visit to a family practitioner	1 hour

		▪ Co-ordination of Care ▪ Community based care and research ▪ Counselling and Communication skills ▪ Continuing Medical Education (CME) Depending on available time the session may be preceded by either an appropriate case vignette or a visit to a family practitioner		

Assessment: Formative: Reflective writing

2. Skills

The fresh undergraduate student should be aware of some basic principles of Hospital safety and trained in certain basic skills that are mandated before they enter patient care areas. These are a part of quality initiatives to ensure patient and physician safety.

2A and 2B Skills module 1 and 2: BLS and First Aid

New entrants into medical fraternity should have a basic understanding of resuscitation and first aid skills.

The Basic Life Support (BLS): CPR provider training is designed to provide the students with foundational knowledge and skills needed to perform cardiopulmonary resuscitation (CPR) and other lifesaving skills. The first-aid component of this course addresses additional circumstances and diseases that may require intervention and assistance before the patient is transferred to emergency medical services.

FC 2.1	Perform Basic Life support in Skills lab	S	SH
FC 2.2	Perform First Aid in a simulated environment	S	SH

Objectives:

At the end of this session, the student will be able to:

1. Perform adequate chest compressions, deliver adequate ventilations in adults and children and appropriately use of an Automated External Defibrillator (AED).
2. Recognize and initiate first aid for several life threatening emergencies.

150 students can be divided into two groups of 75 each. Each group should be engaged by facilitators for a three hour session inclusive of break and subsequently groups should be rotated.

Group 1: Basic Life Support

No	Sub Session	Methods	Requirements	Time
1	Introduction	Introduction to Basic Life Support. Its importance and need.		15 minutes
2	Demonstration with appropriate videos followed by Hands on training	15 groups of 5 students each = 75 Total Demonstrate individual skills of basic life support followed by hands on practice of each skill and finally integration of all the skills in a patient scenario. • Introduce them to C-A-B algorithm • Recognition of cardiac and respiratory arrest • Pulse check • Chest compression • Delivering effective breaths • Use of an AED • Integration of all skill sets into a single scenario. These skills will be taught for both adults and children (including infants)	Space/Area to accommodate 75 students, Adult, child and infant Basic Life support mannequins. LCD projector with adequate sound facilities to show appropriate videos.	2.5 hours (150 minutes)
3	Wrap up	Feedback from students and guidance for future learning		15 minutes

Group 2: First Aid

No	Sub Session	Methods	Requirements	Time
1	Introduction	Introduction to several life threatening emergencies, the importance of first aid and its benefits.		15 minutes
2	Appropriate videos followed by discussion and hands on training when required.	75 students: Table top discussion Initial videos to demonstrate emergency scenarios followed by appropriate first aid. • First Aid Basics (Approach) • Medical emergencies (Breathing problems, Choking, Allergic reactions) • Injury Emergencies (Bleeding, Bandaging, Burns, Electrical Injuries) • Environmental Emergencies (Bites and stings, heat cramps) Emphasis on Do's and Don'ts in each category.	Space/Area to accommodate75 students, adult, child and infant Basic Life support mannequins. LCD projector with adequate sound facilities to show appropriate videos.	2.5 hours (150 minutes)
3	**Wrap up**	Feedback from students and guidance for future learning		15 minutes

Assessment: Assessment of skill performance as a part of the formative assessment

2C Skills Module: Universal Precautions (UP)

FC 2.3	Follow biosafety and universal precautions	S	SH
FC 2.4	Demonstrate handling and safe disposal of Bio hazardous materials in a simulated environment	S	SH
FC 2.5	Demonstrate proper hand washing and use of personal protective equipment	S	SH
FC 2.6	Demonstrate appropriate response to needle stick injuries	S	SH

Objectives:

At the end of this session, the student will be able to:

1. Define Universal Precautions
2. List essential components of Universal Precautions
3. List infective and non- infective body fluids
4. Demonstrate correct techniques of Hand washing, gloving/degloving, disinfection, handling sharps, waste disposal

Methodology

No	Sub Session	Methods	Requirements	Time
1	Definition of Universal Precautions (UP)	Interactive lecture about: ▪ Definition of UP ▪ Essential components of UP ▪ Infective and non-infective body fluids (may use a drill to recap)	LCD projector, Flip charts, Marker pens	1 hour
2	Interactive practical demonstration	▪ Divide the students into groups of not more than 10 per group. There should be one faculty per group who will conduct an interactive practical demo about ▪ Use of hand rub ▪ Gloving and de-gloving The students will be then allowed to demonstrate the correct method and receive feedback		2 hour
3	Wrap up	Summation and learning points		10 minutes

Assessment: Formative assessment, OSCE

2D Skills Module: Waste management

FC 2.7	Demonstrate Biomedical Waste (BMW) segregation, observe and reflect on the process of management of BMW in accordance with National regulation	S	SH

Objectives:

At the end of this session, the student will be able to:

1. Define biomedical waste
2. Explain the hazards of improper disposal of biomedical wastes
3. Describe the different types of waste generated in a health care facility
4. Explain how one should segregate waste
5. Explain how one should dispose biomedical wastes
6. Methodology

No	Sub session	Methods	Requirements	Time
1	Definition of BMW	Interactive lecture about: ▪ Definition of biomedical wastes ▪ Different types of waste generated in a health care facility) ▪ Segregation and disposal of waste	LCD projector, Flip charts, Marker pens	1 hour

Assessment: Students may present a reflection of their observation, OSCE on BMW segregation

2E Skills Module: Immunization

The students should be sensitised to the occupational exposure and the need for protection and safety. During this session, it's important to review the immunisation status of the students and also ensure compliance to the requirements.

FC 2.8	Discuss the Immunization requirements of Health care professionals	K	KH

Objectives:

At the end of this session, the student will be able to:

1. List the vaccine-preventable diseases (VPD)
2. Explain why vaccination is important for staff and students
3. Describe the vaccination recommendation for health care personnel (Hepatitis B, Chicken pox etc.)

Methodology

No	Sub Session	Methods	Requirements	Time
1	Vaccine-preventable diseases and recommendations for health care personnel	Interactive lecture about: • What are vaccine-preventable diseases (VPD)? • Why is vaccination important for staff? • VPDs in healthcare • Recommendation for health care personnel (Hepatitis B, Chicken pox)	LCD projector, Flip charts, Marker pens	1 hour

Assessment: Formative assessment, short notes, Viva in summative assessments

2F Skills Module: Documentation

The students in the first year should be introduced to the importance of “Documentation” in patient care. They should learn the method of appropriate documentation and understand its significance in patient and employee safety.

FC 2.9	Demonstrate awareness of significance of documentation in patient care and the proper method of documentation	S	SH

Objectives

At the end of the session, the students should be able to:

- Explain the importance of documentation as a physician responsibility
- Discuss the consequences of appropriate and inappropriate documentation on patient and employee safety
- Observe the correct method of documentation in patient record
- Reflect on the process

Method: Large group session that gives an overview and demonstrates the documentation process and explains the right and wrong ways.

- The students can be asked to do mock audit and discuss on patient records (dummy records) with a check list .Small group sessions with peer interaction to guide the new students on the process

Assessment: Formative assessment

3. Community Orientation Module

3A. Community Orientation Module: National Health goals and policies/ health care systems / community health

The medical student should be exposed from the beginning to the community in order to get a bird's eye view of the social, demographic, environmental and cultural factors that influence health and the system of health care delivery at the primary level of health care.

FC 3.1	Demonstrate understanding of the National Health Goals and Policies	K	KH
FC 3.2	Discuss the national health scenario, demographic, socio cultural and epidemiological issues	K	KH
FC 3.3	Demonstrate understanding of the health care systems in India with reference to primary, secondary and tertiary level care	K	KH
FC 3.4	Discuss the basic principles of community health and its impact on health and disease	S	SH
FC 3.5	Demonstrate understanding of the structure and functioning of the community health center	K	KH

Objectives:

At the end of this session, the student will be able to:

1. Explain the National Health goals and policies
2. Discuss the National health scenario, demographic, socio-cultural and epidemiological issues
3. Discuss the health care systems in India with reference to primary, secondary and tertiary level care
4. Describe the basic principles of community health and its impact on Health and disease
5. Observe the structure and functioning of the community health centre
6. Reflect on the observation

Methodology

No	Sub Session	Methods	Requirements	Time
1	National Health: goals and policies	Interactive lecture on National health goals and policies	LCD projector, Flip charts, Marker pens	1 hour
2	National health scenario	Interactive lecture on National health goals and policies	LCD projector, Flip charts, Marker pens	1 hour
3	Health care systems in India	Community Health Centre visit and reflection on the experience with particular reference to: A) Levels of health care in a community setting B) Interaction with families in the community setting and the impact of health C) Functioning of the Community Health Centre and health care team Community visit followed by a discussion back in the college	Logistics for community visit	4 hours
4	Principles of community health			
5	Community Health Center			

Assessment: Formative: Reflection writing / discussion of the experience

3B. Community Orientation Module: Interactions with patients and families and communities.

Exposure to the community in the beginning of their profession will sensitize the students to the actual community living of people, the disease impact in the community and its impact on the patient's families and health workers.

FC 3.6	Demonstrate ability to obtain patient experiences through patient and family interactions and relate these experiences to impact of environment and diseases.	S	SH

Objectives:

At the end of this session, the student will be able to demonstrate an understanding of:

1. The effect of family and social environment in the aetiology of diseases
2. Community beliefs and practices related to health and illnesses
3. The environmental health problems in the community
4. Patient experiences to diseases treatment-seeking practice

Methodology

No	Sub Session	Methods	Requirements	Time
1	Interaction with patients and families and communities**.**	• Community Health centre visit and reflection on the experience with particular reference to: • The effect of family and social environment in the aetiology of diseases • Community beliefs and practices related to	Logistics for community visit LCD projector, Flip charts, Marker pens	1 hour (The time for community visit is factored in in the previous session)

		health and illnesses • The environmental health problems in the community • Patient experiences to diseases treatment-seeking practice • Community visit followed by a discussion back in the college		

Assessment: Formative: Reflective writing of their observations

4. Professional Development and Ethics

4A. Professional Development and Ethics Module: Concept of Professionalism and Ethics

The students should be introduced to the concept of professionalism and ethics as an important domain in their learning and practice. They should be made aware of the code of conduct and its significance in life and career.

FC 4.1	Demonstrate understanding of the concept of Professionalism and ethics among health care professionals and discuss the consequences of unprofessional and unethical behavior	S	KH

Objectives:

At the end of this session, the student will be able to:

1. Explain the concept of professionalism and ethics among health care professionals
2. Describe the consequences of unprofessional and unethical behavior

Methodology

No	Sub Session	Methods	Requirements	Time
1	Professionalism and Ethics – the concept	• Interactive lecture about using case vignettes and video • Could use a drill with various scenarios depicting professional and unprofessional behaviour	LCD projector, Flip charts, Marker pens	1 hour
2	Consequences of unprofessional and unethical behavior	• Group work using case vignettes / video • Group presentation and discussion with reference to consequences of unprofessional and unethical behavior		1 hour

Assessment: Formative assessment

4B. Professionalism and Ethics Module: White coat ceremony

FC 4.2	Demonstrate understanding that compassion, altruism, integrity, duty, responsibility and trust are the core values that defines the nature of the physician's work	K	KH

Objective:

At the end of the session, the student is able to:

1. Appreciate the significance of White Coat Ceremony

The white coat reminds physicians of their professional duties, as prescribed by Hippocrates, to lead their lives and practice their art in uprightness and honour. The white coat is a symbol of our profession.

The White Coat Ceremony is a rite of passage, welcoming the new medical students into the medical profession. As medical students, they are bound by the same professional commitments that bind all physicians. This ceremony will join the symbol of the white coat with the virtues of altruism, responsibility, duty, honour, respect, and compassion.

Assessment: Reflections

4C Professionalism and Ethics Module 3: Professional and altruistic behaviour

FC 4.2	Demonstrate understanding that compassion, altruism, integrity duty, responsibility and trust are the core values that defines the nature of the Physician work	K	KH

Objective

At the end of the session, the student should be able to:

- Describe Altruism
- Discuss Altruism as an important professional virtue of a physician

1	Altruism as a virtue of a Physician	• Guest lecture / Address by the dean or director • Case based interactive lecture	LCD projector, Flip charts, Marker pens	1hour
2	Case discussion	• The students will discuss case in groups		1 hour

Assessment: Formative assessment while discussing in groups

4D Professionalism and Ethics Module: Working in a health care team

One of the major roles of the Indian Medical Graduate is that of being a member of a health care team. While the MBBS program is structured to build this competence during its course, an introduction to the concept of working in a team is essential at the beginning.

FC 4.3	Discuss the value of honesty and respect during interaction with peers, seniors, faculty, other health care workers and patients	S	KH
FC 4.4	Discuss the significance of working in a health care team	S	KH

Objectives:

At the end of this session, the student will be able to:

1. Describe the significance of working in a health care team
2. Discuss the role of honesty ,respect and trust

Methodology

No	Sub Session	Methods	Requirements	Time
1	Working in a health care team	1. The students visit several patient care area and observe functioning of the Multidisciplinary teams, such as the emergency OPD, or OT, or labour room 2. The students may be posted in small groups to observe and reflect with regard to the 5	LCD projector, Flip charts, Marker pens	1 hour

		important aspects of working in a team: a. Shared goals b. Communication c. Leadership d. Role clarity e. Trust / respect 3. Group presentation and discussion		

3. **Assessment :** Formative assessment during group discussions / presentations

4E Professionalism and ethics Module 5: Disability competencies

As newly joined medical students, they need to recognize the importance of various deviations from majority that are happening in human life. Disability is part of human diversity. Differently abled individuals need to be understood and recognized by any stream that deals with human life.

India was one of the first major country who ratified the greatest human rights instrument of 21st Century, the United Nations Convention on the Rights of Persons with Disabilities (CRPD) and accordingly amended its disability legislation incorporating human rights approach to Rights of Persons with Disabilities (RPDA) Act, 2016. The Act mandates inducting disability content into all professional courses including medical field.

Educational Strategy

An Indian Medical Graduate is expected to have disability competence which is the skills and attributes essential to provide quality health care to patients with disabilities. It is the social responsibility of medical institutions to be empathetic towards the marginalized section. Disability competencies and suggested teaching-learning methods are provided in table 2.

Table 2. Disability Competencies under the Five Roles of the Indian Medical Graduate (IMG)

IMG Role	FC 4.5 Competencies addressed The student should be able to:	Domain	Level	Suggested TLM	Duration

Clinician	**4.5.1** Describe disability as per United Nations Convention on the Rights of Persons with Disabilities while demonstrating respect for the differences and capacities of persons with disabilities as part of human diversity and humanity.	K	KH	Lecture/or panel discussion involving person with disability	1 hour
Clinician	**4.5.2** Compare and contrast medical and social model of disability.	K	KH	Patient narratives in small groups followed by sharing amongst groups	
Communicator	**4.5.3** Build an understanding on the disability etiquettes while addressing people with disabilities	S/A	SH	Standardized patient with disabilities in small groups followed by sharing amongst groups	1 hour
Lifelong learner	**4.5.4** Demonstrate awareness of the disabilities included in the Rights of Persons with Disabilities Act, 2016.	K	KH	Case histories, incidental reports in small groups followed by sharing amongst groups	
Communicator	**4.5.5** Demonstrate the use of verbal and non-verbal empathetic communication techniques while communicating with people with disabilities	S/A	SH	Clinical patient encounter with guidance in small groups followed by sharing amongst groups	1 hour

Professional	**4.5.6** Demonstrate a non-discriminatory behaviour towards patients or caregivers with disabilities	A	SH	Video or simulated encounters or Forum Theatre (Theatre of the Oppressed) Class room Session	
Lifelong learner	**4.5.7** Have an understanding of accessible healthcare setting for patients with disabilities, including universal design	K	KH	Functioning of NGO or accessible Disability Unit	Visit or SGD-2 hours
Leader	**4.5.8** Advocate social inclusion by raising awareness of the human rights of persons with disabilities.	K	KH	Self-reflection paper/blog SDL	SDL- 2 hours

Modified-from Disability-inclusive Compassionate Care: Core Competencies on Disability for Health Professions Education by Medical Humanities Group, UCMS, Delhi

4F. Professionalism and Ethics Module: Cultural competence

Cultural competence is the ability to interact respectfully with colleagues from any culture and requires critical consciousness. It is a congruent set of behaviours, attitudes, skills, policy and procedures that come together in a system, agency, or among individual professionals to enable them to work effectively in cross cultural situations. This is relevant for the medical students as they are joining MBBS in medical colleges throughout all states in India and students from outside India are also joining medical colleges in India. Therefore, the cross cultural component will help students a lot as the cultural diversity is unique and vast in the country.

FC 4.6	Demonstrate understanding and respect of cultural diversities and interact with those with different cultural values	K/A	KH

Objectives:

At the end of this session, the student will be able to:

1. Describe components of cultural competence

Methodology

No	Sub Session	Methods	Requirements	Time
1	Components of cultural competence	• An interactive lecture on the components	LCD projector, Flip charts, Marker pens	1 hour

Professionalism and Ethics Module: Stress management

The first year students are challenged with many changes including the new place,peers, atmosphere, environment and a major leap in the learning styles and contents. This induces stress making them vulnerable. Hence, it is important to address the role of stress during their learning period and methods to enhance their resilience.

FC 4.7	Discuss the significance and methods of stress management and risk taking behaviour.	K	KH
FC 4.8	Understand the role of yoga and meditation in personal health	S	S

Objectives

At the end of the session, the student should be able to:

- Describe the situation that may cause stress during their learning period
- Discuss the health impact of stress
- Appreciate the various stress management techniques including yoga and meditation
- Discuss the spectrum of risk - taking behaviour, consequences and ways to manage

Case based discussion to be held in small groups on stressful situations such, academic stress, examination stress, peer pressure, family pressure, gender issues, discrimination, dealing with emotions. Various risk taking behaviours such as violence, drug abuse, rash driving, bullying etc. should be addressed.

A Yoga / Meditation demonstration by an expert followed by reflection on the experience may be done.

4 H Professional Development and Ethics Module: Time management

Good time management is essential for a Professional. Many deadlines for college work occur at the same time, and unless the student plans ahead, he/she will find it difficult to manage. Learning how to manage time will help them maintain academic performance as well as a life outside of school.

FC 4.9	Discuss the significance and appropriate ways of time management	S	SH

Objectives:

At the end of this session, the student will be able to:

1. Describe the importance of time management
2. Prioritize their activities in order to manage time better
3. Identify and handle their own distractions and interruptions

Methodology

No	Sub Session	Methods	Requirements	Time
1	Importance of time management	• An interactive lecture	LCD projector, Flip charts, Marker pens	1/2 hour
2	Prioritization	• Group work using the “action priority matrix” • Discussion		1 hour

3	Distractions and Interruptions	• Administer the time management skills questionnaire • Students to reflect their own strengths • Ask students to work in groups and write down what they think are the main distractions / interruptions that a MBBS student will face. • Ask the groups to discuss and present the solutions to the above		1 hour
4	Wrap up	Summarize and take general feedback about the session		5 minutes

Assessment: Formative

4I Professional Development and Ethics Module: Interpersonal relationship

The students should understand the role of interpersonal relationship while interacting with the patients, families, peers, superiors and health care personnel. They should understand the significance of these interactions and professional boundaries. They should understand and experience the role of mentoring in personal and professional growth.

FC 4.10	Demonstrate understanding of importance of interpersonal relationship while working in a health care team	S	KH
FC 4.11	Understand the role of mentoring	S	KH

Learning method:

(1) Role plays to understand the significance of interpersonal relationship and group discussion

(2) Interactive lecture on Mentoring followed by allotment of mentors to the new batch

(3) Mentor-Mentee interaction and road ahead

4J Professionalism and Ethics: Learning

After years of formal schooling, students enter the MBBS course often without having mastered the fundamental skills of learning. When they begin their course and are propelled into a more active learner mode, understanding of these fundamentals becomes vital. Students will learn how to learn through many avenues, such as modelling, curiosity, and situational need. This session on learning is included in the Foundation Course as a way to help them understand the process learning.

FC 4.12	Demonstrate understanding of the process of group learning and group dynamics	S	KH
FC 4.13	Comprehend the learning pedagogy and its role in learning skills	S	KH

FC 4.14	Demonstrate understanding of different methods of self-directed learning	S	KH
FC 4.15	Understand collaborative learning	S	KH

Objectives:

1. To recognize the need to learn
2. To identify and maximize one's learning style
3. To describe how people learn
4. Experience collaborative and group learning
5. Discuss the methods of SDL and its application in their routine learning

Learning method

- Students are subjected learning style evaluation and asked to reflect
- Students are exposed to various methods through self -experience and role play and asked to reflect

Assessment: Nil

5 Enhancement of Language and Computer Skills:

5A Enhancement of Language and Computer Skills Module: Communication

Good communication skills are essential for an optimal doctor-patient relationship, relationship between peers/colleagues and also colleagues in a team which ultimately also contributes to improved health outcomes. Training in communication skills needs approaches which are different from that of teaching other clinical subjects.

FC5.1	Demonstrate ability to communicate with patient and families, be aware of barriers to communication and appropriate ways to respond	C	SH

Objectives:

At the end of this session, the student will be able to:

1. Describe the basic elements of communication skills
2. Explain the importance of listening and empathy in communication
3. Explain the importance of good communication skills in medicine
4. Recognise the common barriers to communication
5. Observe patient and family interactions (Videos , Role plays)
6. Reflect on the appropriate ways to respond

Methodology

No	Sub Session	Methods	Requirements	Time
1	Basic communication skills	• Lectures (PPT), role plays, group	LCD projector, Flip charts,	3 hours

2	Listening skills	discussions, brainstorming	Marker pens	
3	Importance of empathy in communication skills			
4	Importance of good communication in medicine			
5	Observe patient and family interactions	• Video demo / Role play of patient and family interaction • Ask students to reflect on appropriate and inappropriate responses	Video	

Assessment: Formative during group discussions

5B Enhancement Skills Module 8: Local Language skills

The local language skills training will be conducted as per the felt need and may continue beyond the Foundation Course.

FC 5.2	Demonstrate use of local language in patient and peer interactions	C	SH

Sessions will be organised in small groups and rotated between enhancement skills

5C Enhancement Skills Module 8: English Language skills

The English language skills training will be conducted as per the felt need and may continue beyond the Foundation Course.

FC 5.3	Demonstrate ability to communicate and learn in English	C	SH

Sessions will be organised in small groups and rotated between enhancement skills

Enhancement of Language and computer skills Module: Basic computer skills

The students should be competent in the use of ICT in teaching and learning. The students should be introduced to the basic use of word and power point, familiar with search engines, in performing a literature search and accessing online resources.

FC 5.4	Demonstrate basic computer skills	S	SH
FC 5.5	Demonstrate ability for accessing online resources	S	SH

The students are posted to the computer / Active learning centre for the training and it will continue as per need of the students beyond Foundation Course

6 Sports and extracurricular activities

Should be for a mandatory 4 hours per week and extra-curricular activities 2 hours per week, subject to a maximum of 22 hours

1. Further Reading link

https://www.mciindia.org/CMS/wp-content/uploads/2019/01/UG-Curriculum-Vol-I.pdf

https://www.mciindia.org/CMS/wp-content/uploads/2019/01/UG-Curriculum-Vol-II.pdf

https://www.mciindia.org/CMS/wp-content/uploads/2019/01/UG-Curriculum-Vol-III.pdf

https://www.mciindia.org/CMS/wp-content/uploads/2019/01/AETCOM_book.pdf

BOARD of GOVERNORS in supersession of Medical Council of India

COMPETENCY BASED UNDERGRADUATE CURRICULUM FOR THE INDIAN MEDICAL GRADUATE

Knows Knows how Shows Shows how Performs

Describe Enumerate Observe Demonstrate Assist

Counsel

Integrate

Analyse

Logbook Guidelines

Interpret

Guide

Communicate

Critique

Clinician Communicator Team Leader Professional Lifelong Learner

Knowledge Skills Attitude Values Responsiveness Communication

Curriculum Implementation Support Program

Guidelines for preparing Logbook

for

Undergraduate Medical Education Program

Medical Council of India
Pocket-14, Sector-8, Dwarka,
New Delhi 110 077

This booklet has been prepared by the Expert Group nominated by the Board of Governors in supersession of the Medical Council of India, for use by faculty members / institutions / Universities. These guidelines for recording logbook entries are recommended to be followed for the MBBS students from the academic year 2019-20 onwards. This module aims to create a standard protocol for documenting the achievement of selected competencies listed in the Competency Based UG Curriculum (2018) and the Regulations on Graduate Medical Education, 2019, Part II.

The instructions given herewith are guidelines only for the colleges / Universities and can be adapted / modified as per requirements.

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Guidelines for preparing Logbook

Foreword

The competency driven curriculum places great emphasis on the acquisition of a pre-defined set of knowledge, skills, attitude and values that would allow the learner to become a physician of first contact in the community. Traditional summative assessment is not sufficient to ensure that the learner has indeed acquired requisite competencies. A formative process that documents the progression of the learner in the acquisition of competencies by him or her therefore becomes a necessary and integral tool. As defined in this booklet, the logbook is a *verified record* of the progression of the learner documenting the acquisition of the requisite knowledge, skills, attitude and/or competencies. The logbook thus is an academic document that becomes both a snap shot of the progress of the learner as well as a prerequisite for progression to the next phase of learning or graduation from the course.

This booklet provides a guide as well as examples on how the traditional logbook can be modified to work in alignment with the principles of the competency driven curriculum. Importantly, it illustrates through example, planning of activities, derivation of components of the activity, criteria for successful completion, remedial and feedback into the log table. This sample may be used and adapted as required for the local needs of colleges.

This sample booklet has been developed by the curriculum expert group based on the needs of the competency driven curriculum. As we gain experience with the curriculum we are keen to learn best practices from colleges across the nation and how institutions have adapted the logbook to help their learners.

Chairman, BOG

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भारतीय आयुर्विज्ञान परिषद्

MEDICAL COUNCIL OF INDIA

BOARD OF GOVERNORS
IN SUPERSESSION OF MEDICAL COUNCIL OF INDIA

Guidelines for preparing Logbook

Foreword

This booklet has been developed by the curriculum expert group to help institutions to create a logbook that documents the undergraduate student's acquisition of skills and record of other important activities required as part of the academic program. Completion of the activities specified and submission of the certified logbook is a **prerequisite** for a student to apply for the end of phase summative examination.

This booklet provides a sample template for the logbook as well as a simple log table that will allow institutions to document and act on various activities that are required by students to complete the course. It also emphasises the need for feedback and remedial action when required to be taken by the students.

The templates provided here can be adapted by institutions in print or in the electronic format. Logbooks can be created phase -wise or subject - wise. Evidence for the activities in the logbook can be maintained in a portfolio or as an Annexure to the logbook.

The logbook is an important document recording the student's progress. The suggested log format supports objectives enunciated in the competency driven undergraduate curriculum by helping document competency acquisition by the learner.

Vats

(Dr. R. K. Vats)
Secretary General

Logbook for the MBBS Curriculum

Introduction

A key aspect of the new Competency Based UG Curriculum is the emphasis on acquisition of competencies as a requisite for progression in the course. Active learning process by the student and his/her progression to achievement of competencies / pre-determined tasks need to be documented. A record of activities completed and competencies acquired is necessary to ensure that the learner has acquired the key competencies. The logbook forms an integral part of the formative / continuous assessment program. This document outlines the means and processes to create and record such activities in the form of a unified logbook. The process is illustrated using examples based on the principles of formative evaluation. This is a suggested format. Institutions can develop their own process and records based on local requirements incorporating the major elements outlined in this document.

Glossary

Logbook: is a *verified record* of the progression of the learner documenting the acquisition of the requisite knowledge, skills, attitude and/ or competencies.

Portfolio is a collection of learner's progression in tasks and competencies. A portfolio is an evidence of events documented in the logbook. It includes selected assignments, self-assessment, feedback, work-based and in-training formative assessments, reflections and learnings from planned activity in the curriculum. **The maintenance of portfolio is desirable. If portfolio is not possible to be maintained, an annexure to logbook can be used for documenting details.**

Activity: This term refers to a predefined task performed by learners that contributes to the achievement of stated objectives or competencies.

Remedial: Remedial is a planned activity aimed at correcting deficits that prevent a learner from achieving an intended outcome.

Feedback: Feedback is a formal active interaction performed at the completion of an observed activity (or activities) intended to facilitate positive change, growth and improvement of the learner through guided reflection of activity (ies) performed.

The faculty will determine the competencies that need to be part of the logbook. Skill competencies that have Performance '(P)' automatically qualify to be in the logbook most of the time. Selected skill competencies with Shows How '(SH)' in the psychomotor and communications domains will require a logbook entry.

Certain competencies which require documentation of self-directed learning - reflections, narrative and creative writing experiences, participation in group activities such as seminars, symposia etc. may be included in the logbook. Competencies that require documentation of collected clinical or laboratory experiences, predetermined patient or community interactions such as field visits may also be included in the logbook. Successful documentation and submission of the logbook is a prerequisite for being allowed to take the final summative examination (GMER 11.1.1.b.7).

The competencies addressed during Foundation Course should be entered in the logbook of the first professional year. Since AETCOM is a longitudinal program, it should find a place in the logbook of each professional year or have its own logbook spreading across the years.

Whether logbooks are maintained subject-wise or phase-wise, in print or in electronic format is left to the discretion of individual institutions. It is important that the logbook reflects the spirit and purpose of the Competency driven Curriculum, captures and documents the acquisition of chosen competencies and the progress of the student without being unwieldy and inefficient. While it is tempting to enter the acquisition of each and every competency in logbook, this will lead to a drain on faculty time and is best avoided. Hence, many 'K' (Knows) and 'KH' (Knows How) competencies may be left out, unless they lead to activities mentioned above.

Note that all elements of the competency need not be addressed by an activity. Also, the objectives of the competency need not be met in one session. Often multiple sessions are required with progressive enhancement of knowledge or skills leading to the acquisition of the competency. Indeed, this can take place in sessions spread over two or more phases.

The faculty will determine the level of achievement or criteria that will determine satisfactory (meets expectations) completion of the activity and contribute towards the acquisition of the competency. The faculty will use a numerical score but should determine the pass or satisfactory score. The faculty will also prescribe what a learner should do if he or she does not meet the expectations and hence has not successfully completed the activity i.e. should he or she repeat the activity? should there be remedial training after x number of repeats? etc.

The performance of the learner must be transferred to the log table (see tables 1, 2 and 3 for professional year 1) . Explanation for each column in the table is provided after Table 3.

Table 1. Sample template of Logbook page in Human Anatomy

Subject: Human Anatomy **First Year MBBS**

Sub Item: Dissection / Histology / Museum sessions / Vertical Integration / Early Clinical Exposure / Seminar / Self Directed Learning

1	2	3	4	5	6	7	8
Competency # addressed	**Name of Activity**	**Date completed: dd-mm-yyyy**	**Attempt at activity** First or Only (F) Repeat (R) Remedial (Re)	**Rating** Below (B) expectations Meets (M) expectations Exceeds (E) expectations OR Numerical Score	**Decision of faculty** Completed (C) Repeat (R) Remedial (Re)	**Initial of faculty and date**	**Feedback Receive**d Initial of learner

Separate sheet(s) for Foundation Course, AETCOM, Humanities, Sports, extracurricular activities, subjects (as in the index), needed.

(This table can be replicated in as many pages, as needed)

Table 2. Sample template of Logbook page in Biochemistry

Subject: Biochemistry **First Year MBBS**

Sub Item: Practicals (Student Lab.) / Practicals(Clinical Lab.) / Vertical Integration / Early Clinical Exposure / Seminar / Self Directed Learning

1	2	3	4	5	6	7	8
Competency # addressed	**Name of Activity**	**Date completed: dd-mm-yyyy**	**Attempt at activity** First or Only (F) Repeat (R) Remedial (Re)	**Rating** Below (B) expectations Meets (M) expectations Exceeds (E) expectations OR Numerical Score	**Decision of faculty** Completed (C) Repeat (R) Remedial (Re)	**Initial of faculty and date**	**Feedback Receive**d Initial of learner

Table 3. Sample template of Logbook page in Physiology

Subject: Physiology **First Year MBBS**

Sub Item: Practicals (Student Lab.) / Practicals(Human Physiology) / Vertical Integration / Early Clinical Exposure / Seminar / Self Directed Learning

1	2	3	4	5	6	7	8
Competency # addressed	**Name of Activity**	**Date completed: dd-mm-yyyy**	**Attempt at activity** First or Only (F) Repeat (R) Remedial (Re)	**Rating** Below (B) expectations Meets (M) expectations Exceeds (E) expectations OR Numerical Score	**Decision of faculty** Completed (C) Repeat (R) Remedial (Re)	**Initial of faculty and date**	**Feedback Receive**d Initial of learner

Explanation of each column in the logbook table (Tables 1, 2, 3 above)

1. The **number** of the competency addressed includes the subject initial and number (from Vol. I, II, or III of the UG Curriculum)
   e.g., AN 2.1
2. **Name of activity** -
   e.g., Seminar on Liver or Group discussion or Session 1 of CPR (if the institution has numbered each activity, the number may be entered)
3. **Date the activity gets completed**
4. **Attempt at activity by learner**: Indicate if:
   a. First attempt (or) only attempt
   b. Repeat (R) of a previously done activity
   c. Remedial activity (Re) based on the determination by the faculty
5. **Rating - Use one of three grades:**
   a. Below expectations (B);
   b. Meets expectations (M)
   c. Exceeds expectations (E)
6. **Decision of faculty**
   a. C: activity is completed, therefore closed and can be certified, if needed
   b. R: activity needs to be repeated without any further intervention
   c. Re: activity needs remedial action (usually done after repetition did not lead to satisfactory completion)

7. Initial (Signature) of faculty indicating the completion or other determination

8. Initial (Signature) of the learner if feedback has been received.

The logbook shall have pages dedicated to participation in Foundation Course (in first phase) and AETCOM activities (in all phases). There can be a logbook for each phase, which must be submitted before the examination and available for university examiners to review, if necessary or at random. If the subjects are included in more than one phase (e.g. Community Medicine, General Medicine etc.), the subjects can have a logbook covering various competencies (activities) in all phases.

The final summary page at the end of the logbook (see appendix 1) can have a quantitative expression as to the percentage of achievement of competencies at various levels. This page may be replicated in logbooks of subsequent phases (unless a common book is used). **The sample templates given above pertain to the first Phase of the MBBS course but can be modified and used for other phases as well.**

Illustrative Examples

1. Psychomotor skills

An example of a psychomotor skill that has to be acquired in Phase 1 is given here step-wise, from identifying the competency to the logbook entry required.

1. **Competencies identified:**
    - **a.** PY6.8: Demonstrate the correct technique to perform & interpret Spirometry.
    - **b.** PY6.9: Demonstrate the correct clinical examination of the respiratory system in a normal volunteer or simulated environment.
    - **c.** PY6.10: Demonstrate the correct technique to perform measurement of peak expiratory flow rate in a normal volunteer or simulated environment.

    It is desirable to break down the competency into objectives so that learning sessions can be devised accordingly

2. **Name of activity:** Examination of the Respiratory System in normal persons.

3. **Components of activity:**
    - **a.** Attend teaching session on PY6.7. Describe and discuss lung function tests & their clinical significance.
    - **b.** Attend practical session on examination of the respiratory system and measurement of lung function.
    - **c.** Review video available (optional).
    - **d.** Demonstrate (by student) examination of the respiratory system, incentive spirometry and peak expiratory flow rate in a volunteer or standardised patient accurately.
    - **e.** Interpret a set of given patterns of Pulmonary Lung Function Tests (PFTs) accurately.

4. **Criteria for successful completion of activity**
    - **a.** Demonstration of examination and procedure as pre-specified.
    - **b.** Interpretation of PFT patterns provided accurately.

5. **Numerical scoring for activity**

    Not required.

6. **Documentation of activity in portfolio or Annexure of logbook**

    Not required.

7. **Recommended action when learner is unsuccessful**
    - **a.** Provide feedback
    - **b.** Allow repeat
    - **c.** If repeat x 2 is unsuccessful, learner must review video available / work with the faculty prior to retaking the activity.

8. **Any other comments**

    Equipment required to be listed

Sample logbook entry for psychomotor skills (see Tables 4 & 5)

Table 4: Sample logbook entry for psychomotor skills where the student has successfully completed the activity

Subject: Physiology **First Year MBBS**

Sub Item: Practicals (Physiology)

1	2	3	4	5	**6**	7	8
Competency # addressed	**Name of Activity**	**Date dd-mm-yyyy**	**Attempt at activity** First or Only (F) Repeat (R) Remedial (Re)	**Rating** Below (B) expectations Meets (M) expectations Exceeds (E) expectations Or Numerical Score	**Decision of faculty** Completed (C) Repeat (R) Remedial (Re)*	**Initial of faculty and date**	**Feedback Receive**d Initial of learner
PY6.8	Demonstrate the correct technique to perform & interpret Spirometry	18-09-2019	F	M	C		
PY6.9	Demonstrate the correct clinical examination of the respiratory system in a normal volunteer or simulated environment	19-09-2019	F	M	C		
PY 6.10	Demonstrate the correct technique to perform measurement of peak expiratory flow rate in a normal volunteer or simulated environment	20-09-2019	F	M	C		

Table 5: Sample logbook entry for psychomotor skills where the student has not successfully completed the activity

(S)He had to repeat it. And he or she has completed it a week later. Then the logbook entry will appear thus.

Subject: Physiology **First Year MBBS**

Sub Item: Practical (Physiology)

1	2	3	4	5	6	7	8
Competency # addressed	**Name of Activity**	**Date dd-mm-yyyy**	**Attempt at activity** First or Only (F) Repeat (R) Remedial (Re)	**Rating** Below (B) expectations Meets (M) expectations Exceeds (E) expectations Or Numerical Score	**Decision of faculty** Completed (C) Repeat (R) Remedial (Re)	**Initial of faculty and date**	**Feedback Receive**d Initial of learner
PY6.8-6.10	Respiratory exam in normal	19-09-2019	F	B	R		Yes, Initial

2. AETCOM Competency

1. Competency identified:

a. AETCOM module 1.4 (also included as IM 26.20)

Ability to communicate to patients in a patient, respectful, non-threatening, non- judgmental and empathetic manner

2. Name of activity:

i. Large group session- 2 hours

ii. Self-directed learning with documentation of personal reflection- 2 hours

iii. Small group discussions – 2 hours

iv. Discussion and closure – 1 hour

3. Components of activity:

a. Introductory large group sessions on the principles of communication.

b. Self-directed/Guided learning by students on the importance and techniques of effective communication.

c. Small group sessions on improving communication. These sessions can include either videos or role play highlighting common mistakes in patient - doctor communication and allowing students to identify these mistakes and discussing on how to correct them.

d. Closure session with reflection by students in a small group based on sessions 1, 2 and 3 and with emphasis on learning done and future directions.

4. **Criteria for successful completion of activity:** Active participation in 3 a, b & c

i. Assessment of reflections by peer groups / mentors

5. **Numerical scoring for activity:** Not required

6. **Documentation of activity in portfolio or Annexure of logbook:**
Required. Document reflection

7. Recommended action when learner is unsuccessful

i. Provide feedback
ii. Allow repeat / discuss chance to improve in subsequent sessions.
iii. If repeat x 2 is unsuccessful learner must review video available / work with the faculty prior to retaking the activity.

8. Any other comments

Student reflections may be part of the portfolio as a record of the activity done.

Table 6. Sample logbook entry where the student has successfully completed the activity

Subject: AETCOM **MBBS Phase I**

1	2	3	4	5	**6**	7	8
Competency # addressed	**Name of Activity**	**Date dd-mm-yyyy**	**Attempt at activity** First or Only (F) Repeat (R) Remedial (Re)	**Rating** Below (B) expectations Meets (M) expectations Exceeds (E) expectations OR Numerical Score	**Decision of faculty** Completed (C) Repeat (R) Remedial (Re)	**Initial of faculty and date**	**Feedback Receive**d Initial of learner
AETCOM 1.4	Basics of communication (P1)	22-10-2019	F	M	C		

This competency is completed by various activities on a longitudinal basis through various phases and hence it is important that the logbook is maintained/ available through the phases.

3. Documentation of field or clinic visit

Pre-specified activities that are part of the curriculum need to be captured in the logbook. One such example is a community visit or specialised clinic visit.

1. **Competencies identified**
   PE 6.11 Visit to the Adolescent clinic
2. **Name of activity**
   Visit to adolescent clinic
3. **Components of activity:**
   a. Activity is planned
   b. Learner visits center in small groups
   c. A briefing session is provided
   d. Learner understands organisation, team work, services provided, criteria for referral
   e. Learner observes care provided to adolescents
   f. Learner interacts with team members
   g. A debrief of learning done is provided
   h. Learner writes a summary of observation and reflection
4. **Criteria for successful completion of activity**
   Activity completed and documented in logbook
   Summary of observations placed in portfolio or Annexure to logbook
5. **Numerical scoring for activity**
   Not required
6. **Documentation of activity in portfolio or Annexure of logbook**
   Required. Document narrative of visit and learnings
7. **Recommended action when learner has not completed the task satisfactorily**
   a. N/A
8. **Any other comments**

Table 7. Sample logbook entry where the student has successfully completed the visit

Subject: Pediatrics **MBBS Phase III (2)**

Sub item: Visit to Adolescent Clinic

1	2	3	4	5	**6**	7	8
Competency # addressed	**Name of Activity**	**Date dd-mm-yyyy**	**Attempt at activity** First or Only (F) Repeat (R) Remedial (Re)	**Rating** Below (B) expectations Meets (M) expectations Exceeds (E) expectations OR Numerical Score	**Decision of faculty** Completed (C) Repeat (R) Remedial (Re)	**Initial of faculty and date**	**Feedback Receive**d Initial of learner
PE 6.11	Visit to Adolescent Clinic	17-09-2019	F	M	C		

Appendix I

Sample Logbook for professional year 1

College Emblem

Name and address of the college:

Personal details
Name of the student: Date of admission to MBBS Course: Date of beginning of the current Phase: Reg: No. (College ID) Reg. No. (University ID) Permanent Address: E mail ID: (optional) Mobile Number: (optional)

LOGBOOK CERTIFICATE (Sample)

This is to certify that the candidate Mr/ Ms ……, Reg No. ……., admitted in the year 2019-20 in the ---------- Medical College, ---------- has satisfactorily completed / has not completed all assignments /requirements mentioned in this logbook for first year MBBBS course in the subject(s) of Anatomy/ Physiology/Biochemistry/Foundation Course/ AETCOM during the period from …… to……. . She / He is / is not eligible to appear for the summative (University) assessment as on the date given below.

Signature of Faculty

Name and Designation

Countersigned by Head of the Department

Principal/Dean of the College

Place:
Date:

GENERAL INSTRUCTIONS

1) The logbook is a record of the academic / co-curricular activities of the designated student, who would be responsible for maintaining his/her logbook.

2) The student is responsible for getting the entries in the logbook verified by the Faculty in charge regularly.

3) Entries in the logbook will reflect the activities undertaken in the department & have to be scrutinized by the Head of the concerned department.

4) The logbook is a record of various activities by the student like:

- Overall participation & performance
- Attendance
- Participation in sessions
- Record of completion of pre-determined activities.
- Acquisition of selected competencies

5) The logbook is the record of work done by the candidate in that department / specialty and should be verified by the college before submitting the application of the students for the University examination.

INDEX

Sr. No	Description of the course	Page numbers	
		From	To
1	Foundation Course		
2	AETCOM Module		
3	Early Clinical Exposure		
4.	Vertical Integration		
5	Humanities		
6	Subject: Anatomy		
7	Subject: Physiology		
8	Subject: Biochemistry		
9	Extracurricular activities		
10	Sports / Physical Education		

Table 1. Sample of Logbook page in Human Anatomy
Subject: Human Anatomy **First Year MBBS**

Sub Item: Dissection / Histology / Museum sessions / Vertical Integration / Early Clinical Exposure /Seminar /Self Directed Learning

1	2	3	4	5	6	7	8
Competency # addressed	**Name of Activity**	**Date completed: dd-mm-yyyy**	**Attempt at activity** First or Only (F) Repeat (R) Remedial (Re)	**Rating** Below (B) expectations Meets (M) expectations Exceeds (E) expectations	**Decision of faculty** Completed (C) Repeat (R) Remedial (Re)	**Initial of faculty and date**	**Feedback Receive**d Initial of learner

Separate sheet(s) for Foundation Course, AETCOM, Humanities, Sports, extracurricular activities, subjects (as in the index) needed.

(This table can be replicated in as many pages, as needed)

Table 2. Sample of Logbook page in Biochemistry

Subject: Biochemistry **First Year MBBS**

Sub Item: Practicals (Student Lab.) / Practicals(Clinical Lab.) /Vertical Integration /Early Clinical Exposure /Seminar/ Self Directed Learning

1	2	3	4	5	6	7	8
Competency # addressed	**Name of Activity**	**Date completed: dd-mm-yyyy**	**Attempt at activity** First or Only (F) Repeat (R) Remedial (Re)	**Rating** Below (B) expectations Meets (M) expectations Exceeds (E) expectations	**Decision of faculty** Completed (C) Repeat (R) Remedial (Re)	**Initial of faculty and date**	**Feedback Receive**d Initial of learner

Separate sheet(s) for Foundation Course, AETCOM, Humanities, Sports, extracurricular activities, subjects (as in the index) needed.

(This table can be replicated in as many pages, as needed)

Table 3. Sample of Logbook page in Physiology

Subject: Physiology **First Year MBBS**

Sub Item: Practicals (Student Lab.) / Practicals(Physiology) / Vertical Integration / Early Clinical Exposure / Seminar / Self Directed Learning

1	2	3	4	5	6	7	8
Competency # addressed	**Name of Activity**	**Date completed: dd-mm-yyyy**	**Attempt at activity** First or Only (F) Repeat (R) Remedial (Re)	**Rating** Below (B) expectations Meets (M) expectations Exceeds (E) expectations	**Decision of faculty** Completed (C) Repeat (R) Remedial (Re)	**Initial of faculty and date**	**Feedback Receive**d Initial of learner

Separate sheet(s) for Foundation Course, AETCOM, Humanities, Sports, extracurricular activities, subjects (as in the index) needed.

(This table can be replicated in as many pages, as needed)

Final Summary

Sr. No	Description	Dates		Attendance percentage	Status	Signature of Teacher
		From	To		Complete/ Incomplete	
1	Foundation Course					
2	AETCOM Module					
3	Early Clinical Exposure					
4.	Vertical Integration					
5	Humanities					
6	**Subject:** Human Anatomy					
7	**Subject:** Physiology					
8	**Subject:** Biochemistry					
9	Extracurricular activities					
10	Sports /Physical Education					

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Prescribe

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Integrate

Guide

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Correlate

Interpret

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Curriculum Implementation Support Program

Assessment Module for Undergraduate Medical Education 2019

Medical Council of India
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Foreword

A popular maxim in education is - if it is not assessed it is not learnt. The introduction of a competency based curriculum makes assessment a crucial element of learning. Indeed, the emphasis on competencies makes assessment of its attainment and maintenance a prerequisite. Assessment must serve both to provide the continued input on the progress of the learner that will allow him or her to calibrate and improve and also to ensure that only the learner with the right set of knowledge, skills and attitude is allowed to be admitted into the profession and to provide patient care.

The introduction of a competency based curriculum necessitates structured formative assessment, periodic internal assessment and end of phase summative assessment with appropriate and effective feedback built in. In addition, a mechanism to assess and document competency and skill acquisition needs to be in place. Workplace based assessments need to be introduced to the extent possible keeping in mind the roll out of the student doctor program.

The task at hand is complex and requires extraordinary collaboration between teachers, institutions and Universities. This booklet attempts to align the needs of institutions, Universities, learners and teachers with assessment of competencies in the new MBBS curriculum. It has been prepared by invited experts who have worked along with the Expert group for curriculum appointed by the Board of Governors in supersession of the Medical Council of India.

The booklet provides clarity and guidelines that will be useful in the development and implementation of assessment in the competency based environment. There is an increased emphasis on assessment of outcomes through alignment with objectives. Also provided are ideas and strategies for meaningful formative and summative assessment. Summative assessment is the domain of the Universities; however, this booklet provides some principles that Universities can adopt while aligning the examinations to the curriculum that the learners will undergo.

I am grateful to the authors and the expert group who have made this booklet possible. Suggestions for improvement are most welcome. Institutions and Universities are encouraged to share their best practices so that we can all learn together and help bring out better doctors who will be an asset to the community that they serve and to the nation as a whole.

Dr. V. K. Paul

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Foreword

This booklet provides a suggested pattern for Competency Based Assessment for the MBBS program commencing 2019. Summative assessment is the domain of the Universities to whom medical colleges are affiliated. Some changes will be required in the way that learners are tested to meet the requirements in the competency based curriculum. In addition, Competency Based Assessment places increased emphasis on formative and internal assessment. This booklet addresses the needs of institutions, Universities and teachers and is aimed at recalibrating the approach to assessment under the auspices of the new curriculum. The booklet is in alignment with the Regulations in Graduate Medical Education, 2019 Part II document.

This booklet has been developed by experts invited by the Board of Governors in supersession of the Medical Council of India and incorporates their vast expertise and experience. The Board of Governors in supersession of the Medical Council of India acknowledges their time and effort in creating this guide that can be used by institutions to develop their own learning process and content. Appreciation is also due to the efforts of the Academic Cell and faculty at the various Regional and Nodal centres who continue to work tirelessly to ensure that the new competency based curriculum and its various unique components are implemented faithfully and flawlessly across the medical colleges in this country. This will best serve the needs of the country and the cause of medical education.

(Dr. R.K. Vats)
Secretary General

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Curriculum Implementation Support Program

Module - 3

Assessment

Guidelines for Assessment in Competency Based UG Curriculum

1. Objectives of the Document

To help the reader to:

- Understand the role and place of assessment in new competency based curriculum
- Understand the changes in assessment as per new curriculum.
- Understand the differences between the traditional assessment and Competency Based Assessment (CBA).
- Understand the components of competency based assessment.
- Understand the tools for competency based assessment.
- Understand the role of feedback in assessment.
- Plan, develop and implement CBA in the colleges and universities.

2. Glossary of terms used in the document

Summative assessment (University examination)	An assessment conducted at the *end of instruction* to check how much the student has learnt.
Formative assessment	An assessment conducted *during* the instruction with the primary purpose of providing feedback for improving learning.
Internal assessment	Range of assessments conducted by the teachers teaching a particular subject with the express purpose of knowing what is learnt and how it is learnt. Internal assessment can have both formative and summative functions.
Validity	Degree to which the inferences drawn from assessment are supported by empirical evidence or theoretical rationale.

Reliability	Degree of confidence that can be placed in the results. Depending on the context, it can be in terms of precision, consistency or reproducibility.
Competency	An observable activity of the health professional with a judicious and consistent mix of knowledge, skills, attitudes and communication.

3. **Introduction**

Competency based education has been defined as an outcome-based approach to the design, implementation, assessment and evaluation of a medical education program using an organizing framework of competencies[1]. Much more than a different style of teaching, competency based curriculum obligates a vastly different perspective on assessment. It mandates greater emphasis on setting up an ongoing and longitudinal assessment so that teachers can identify the stage of the learner and decide whether they need further or different learning opportunities to acquire competency. Assessment in competency based curriculum plays a crucial role in its implementation.

Competency is not an all or none phenomenon. Rather it is incremental. The role of teachers is to help the learner acquire and improve upon the competencies. Competency based curriculum moves away from time bound education and looks at competency as the end point. Consequently, we are no longer interested in demonstration of discrete behaviours by the learners; rather we are interested in application of these in each patient context. Thus, it is more about integration of the required knowledge, skills and attitudes rather than anyone of them in isolation. Therefore, assessment in competency based curriculum should incorporate integration to the extent feasible while maintaining subject identity.

4. **Purpose of assessment in competency based curriculum**

While an obvious purpose of assessment in competency based curriculum is to help the teachers decide if the students have acquired the desired competencies, an equally important purpose is to help the students acquire and improve their competencies. Quality assurance also requires quality assessment.

Major characteristics of competency based assessment are their longitudinal nature, provision of developmental feedback and authentic settings, all of which result in lowering the stakes on individual assessments. This has other important implications also for assessment design. Since the stakes are low and purpose is to improve learning, high standardization and psychometric rigor is not required. Authenticity of assessment task is more important than its structure or objectivity. Expert subjective judgment plays a major role in assessment of competencies.

This difference in perspective stems from three important characteristics of competency based curriculum. First, that by definition, teaching and assessment has to be in the *context* of competencies. Second, that discrete assessment of knowledge, skills and attitudes may not always add up to a competency. Third and probably the most important, that there is a high context specificity in assessment. Performing competency 'A' well does not mean that the student can perform the competency 'B' also as well. Similarly, assessment in demonstration room may not be the same as assessment at the bedside. Moreover, many competencies like communication, team work, sincerity etc. may not be amenable to reliable assessment if done sparingly or only at summative examination. Therefore, all competencies need to be assessed multiple times and in different contexts. An implication of this is that only one summative or end of year examination is not suited for this purpose.

Utility of assessment is traditionally expressed as a notional concept represented as using a product of validity, reliability, acceptability, feasibility and educational impact.[2] For CBA, validity and educational impact are the major determinants of its utility. Despite subjective judgments being involved, their reliability can be improved by increasing the number of assessors, assessments, tasks and by involving all teachers of the department in CBA process. This is a simple intervention to not only take care of subjectivity but also to improve ownership of teaching-learning and assessment.[3]

5. How does CBA differ from traditional assessment?

Traditional assessments are easy to design, administer, score and analyse compared to CBA but may not be able to provide complete information about the stage of the student. Traditional assessments are snap shot observations of learning, are generally not linked to instructions or outcomes and *promote test taking behaviour*. They are fragmented and mainly focus on knowledge (sometimes skills). CBA, on the other hand, provides more comprehensive information about not only the current stage of the student but also about his progression and ascendency. They are longitudinal, often with low stakes and help to reduce examination anxiety. CBA is based on direct observation and therefore helps in generation of authentic feedback, which helps the students to learn better. This process of *assessment for learning* is crucial for the acquisition of competencies.

Competency based assessment should help in collecting and analysing evidence to decide if a student is competent in relation to a required competency and in relation to his/her stage of training. The underlying concept of competency – i.e. the *habitual and consistent* use of knowledge, technical skills, clinical reasoning, communication, emotions, values and reflection in daily practice for the benefit of the individual and the community being served, again demands that the student should consistently demonstrate the desired behaviour rather than only during the final examination.

Competency based assessment aids in the process of learning. Effective feedback is paramount to helping learners improve. CBA is an ongoing process so that any deviation in learning can be recognized early and taken care of by providing formative feedback. This concept is crucial and aligns very well with the basic principles of competency based medical education viz. active involvement of the learner, creating an authentic environment for learning, direct observation and provision of formative feedback. CBA requires active participation of the student in the form of self-assessment and reflections.[4] The paradigm is reflected in figure 1.[5]

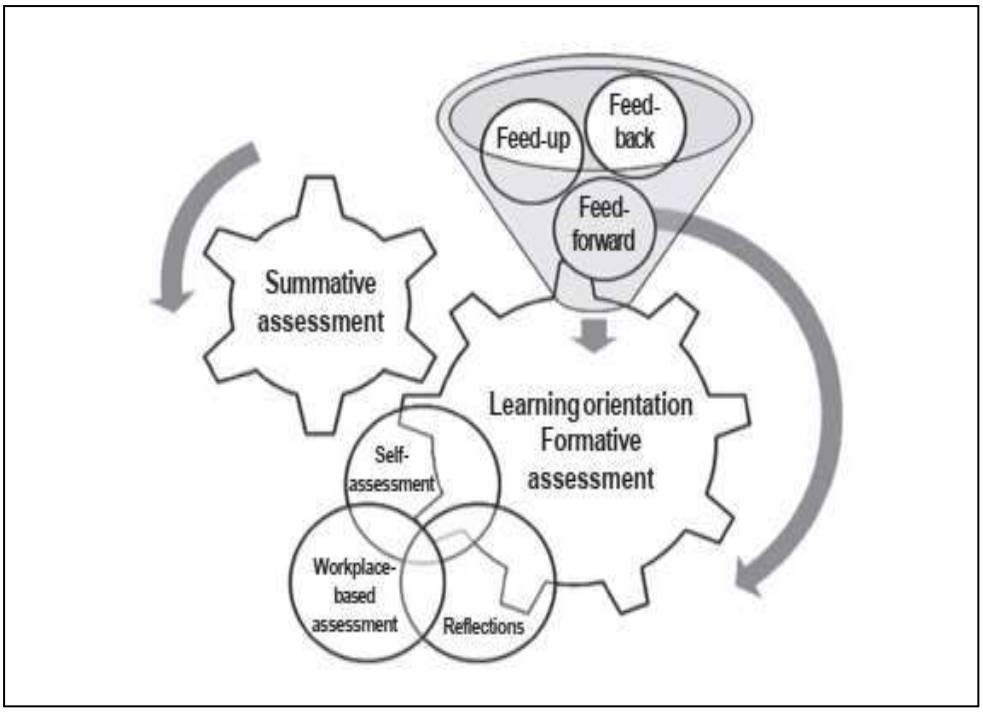


Figure 1. Paradigm of medical student assessment[5]

(Reproduced with permission from National Medical Journal of India)

Medical education literature distinguishes between competence (ability to do) and performance (actually doing). In terms of Miller's pyramid, competence would fall under the 'shows' category while performance falls under 'does'.[6] For the undergraduate students, most of the assessment would be up to 'shows' level. Since they are not authorized to independently take care of the patient or are not directly in charge of patient care, targeting the 'does' level will pose logistic difficulty.

6. What should be assessed?

Assessment requires specification of measurable and observable entities. This could be in the form of whole tasks that contribute to one or more competencies or assessment of a competency *per se*. Another approach is to break down the individual competency into learning objectives related to the domains of knowledge, skills, attitudes, communication etc. and then assess them individually. However, as stated earlier, using individual domain framework may not always result in making an accurate assessment of the specific competency. Therefore, efforts should be made to include competencies in the assessment process as much as possible. CBA is very useful to convey a message to the students to structure their learning around competency framework.

The assessment opportunities can be broadly divided into ongoing and term end. While the term end examinations (Summative assessment) will usually be conducted by the Universities, the ongoing assessments are conducted by the teachers teaching the subject and can be both formal and informal.

The summative assessment e.g. University examinations at the end of professionals, are used for pass or fail decision. The purpose of such assessments is to sample the learning and ensure quality. Since all competencies should be assessed, summative assessments alone are not the option for CBA. For logistic reasons, competencies like communication, team work, ethics, professionalism and many procedural skills are also not assessable at term end examinations.

Ongoing assessment provides many options for this purpose. A blueprint may be needed to decide which competencies should be assessed during internal assessment and which should go to summative or University examinations. Informal assessments should happen during teaching learning activities with the express purpose of finding out the stage of the student and taking corrective action in teaching-learning methodology on an ongoing basis. During lectures, small groups or seminars, use of techniques like clickers, one-minute papers and muddiest point provide valuable information to check understanding and provide developmental feedback.[7] Same can be done during practical/clinical teaching using one-minute preceptor (OMP) or SNAPPS technique (Summarize history and findings, Narrow the differential; Analyze the differential; Probe preceptor about uncertainties; Plan management; Select case-related issues for self-study)[8-10.] Many of these do not need to be considered for pass / fail decisions but are useful to aid learning and acquire competencies. These can be planned by the teachers on a day to day basis and modified depending on the tasks at hand.

Features of Competency Based Assessment (CBA)

- CBA operates within the framework of competencies. Assessment tools should align with competencies/objectives.
- CBA should help to acquire competencies/objectives (*assessment for learning*) and their certification (assessment *of learning*)
- CBA is continuous and ongoing process with opportunities for providing developmental feedback
- Direct observation of students improves utility of CBA and feedback
- Multiple assessors, multiple tools and multiple assessments improve the validity and reliability of CBA

7. Formative & Internal Assessment (IA)

Formative assessment is an assessment conducted during the instruction with the primary purpose of providing feedback for improving learning. It also helps the teachers and learners to modify their teaching learning strategies. The feedback is central to formative assessment and is linked to deep learning, seeking to explore the educational literature and its pedagogical lessons for healthcare educational practice. It provides inputs to both students and teachers regarding adequacy of teaching-learning[10.] A variety of feedback principles and techniques can be used depending on the context.[11, 12]

Although there can be a debate on the summative or formative nature of IA, it still provides the best opportunities for formative purposes. IA is when assessment is done by the teachers who have taught the subject. It overcomes the limitations of day-to-day variability and allows larger sampling of topics, competencies and skills.

In competency based curriculum, IA provides useful avenues for both formative and summative assessment. IA focuses on the content and process of learning i.e. what and how students have learnt throughout the course. This assessment gives priority to psychomotor, communication and affective domains. These domains are usually not assessed by the traditional assessment methods. It should involve all faculty members of a department (Senior Residents upwards) and not just one or two senior teachers. This helps to build ownership of teaching-

learning and assessment as well as provide 'hands-on' experience in assessment to all teachers. IA can be a very useful tool for assessing all competencies in any competency based curriculum.

IA should not be considered as an assessment without external controls and can be utilized in a manner to overcome some of its perceived weaknesses. Utility of IA can be further improved by involving all teachers in the department and limiting the contribution of individual teacher, test or tool.[12]

8. **Designing a system of assessment**

While designing an internal assessment, all domains of learning i.e. cognitive, psychomotor and affective should be taken into account and weightage should be assigned to these domains for assessment.

Miller's pyramid (figure 2) provides a simple way to select appropriate tool for assessment. Efforts should be made to climb higher in the pyramid.[6, 13]The following adapted example illustrates this:

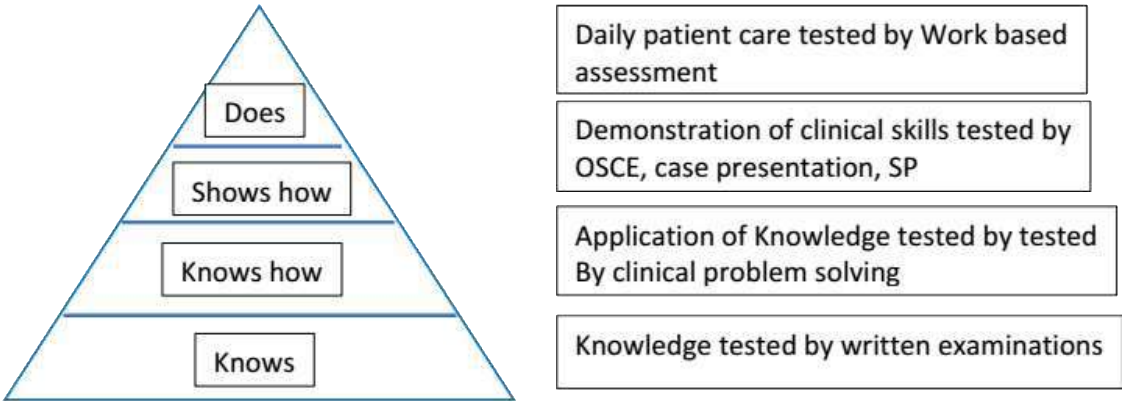
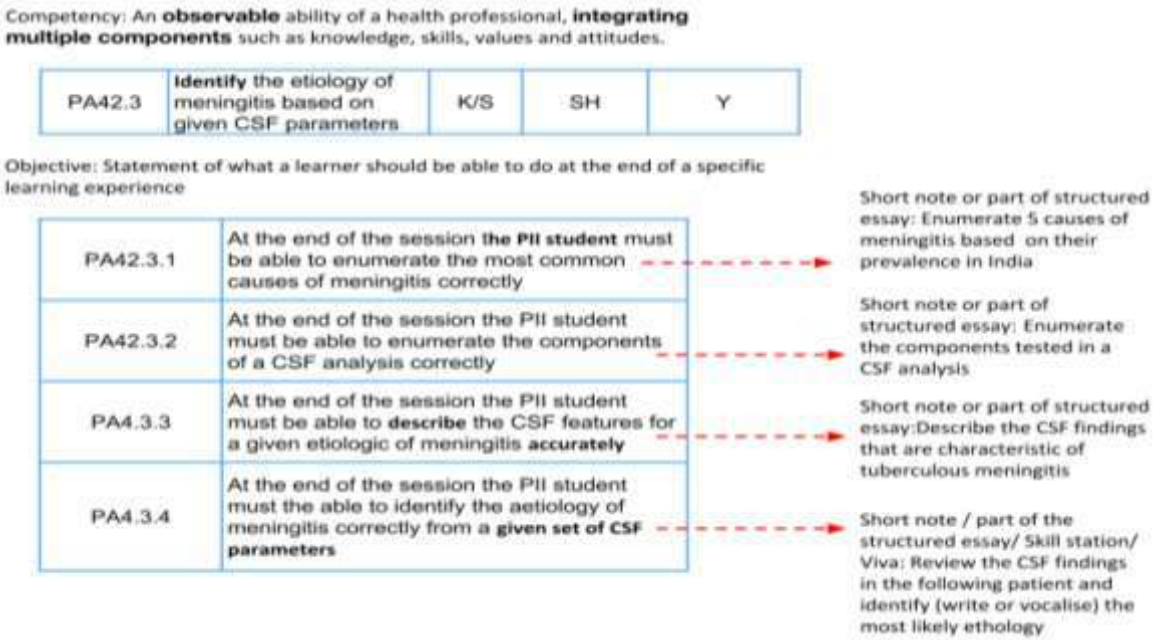


Figure 2. Assessment methods as per levels of competency (Adapted from Ramani)[13]

OSCE: Objective Structured Clinical Examination, SP: Standardised/ Simulated Patients

The key to building validity and making CBA assessment useful is its alignment with competencies/objectives. Including some aspects from competencies of other phases is useful to assess integration of concepts. Some examples of such alignment can be seen in the competency sheet given inTable1.

Table 1. Deriving assessment methods from objectives



A useful approach, especially for affective, psychomotor and communication domains, is to adopt the concept of *assessment toolbox.* A toolbox is a listing of available tools (and rating forms, if required), which are suggested for a particular competency or sub-competency and aims at improving the value of assessment data.[14] The listed tools are suggestions only and can be freely used either singly or in combination by teachers to suit particular requirements. Efforts should be made to use multiple tools for a given competency to improve validity and reliability of assessment.

While assessment will continue to be subject based, efforts must be made to ensure that phase appropriate correlates are assessed to determine if the learner has internalised and integrated the concept and its application.

a. Internal Assessment logistics

Scheduling of IA

A proposed schedule of tests for IA is given in Annexure 1**.** These are minimum required numbers but more tests can be scheduled by departments as required. An end of posting clinical assessment shall be conducted for each clinical posting in each professional year. Prior to University examinations, departments can conduct additional tests as and when required with the purpose of providing

formative feedback to the students. In subjects that are taught at more than one phase, proportionate weightage must be given for internal assessment for each Phase. For example, General Medicine must be assessed in second Professional, third Professional Part I and third Professional Part II, independently. A student who has not taken minimum required number of tests for IA each in theory and practical will not be eligible for university examinations. Proper records of the work should be maintained which will form the basis for the students' internal assessment and should be available to the assessors at the time of inspection of the college by the Medical Council of India.

Components of IA

(i) **Theory IA can include**: Written tests, should have essay questions, short notes and creative writing experiences.

(ii) **Practical / Clinical** IA can include: practical / clinical tests, Objective Structured Clinical Examination (OSCE) / Objective Structured Practical Examination (OSPE), Directly Observed Procedural Skills (DOPS), Mini Clinical Evaluation Exercise (mini-CEX), records maintenance and attitudinal assessment.

(iii) **Assessment of Log-book**. Log book should record all activities like seminar, symposia, quizzes and other academic activities. Achievement of certifiable competencies should also be recorded in logbooks. It should be assessed regularly and submitted to the department. Up To twenty per cent IA marks (Theory and Practical) should be from Log book assessment.

(iv) **Internal Assessment for Professional development programme (AETCOM)** will include:

a. Written tests comprising of short notes and creative writing experiences in each subject.

b. OSCE based clinical scenarios and/or viva voce. Skill competencies acquired during the Professional Development Programme must be tested during the clinical, practical and viva voce in every subject.

Colleges and teachers should try to build capacity to use a variety of assessment tools. A number of tools are available in the form of assessment toolbox.[14] The construct validity and predictive utility of internal assessment is high.[15] Many of the tools mentioned for IA may appear subjective. However, by virtue of being high on *validity* and by conveying a message to the students not to ignore skills, attitudes and communication (*educational impact*), they contribute to better learning. Since stakes at IA are low, the use of expert subjective assessments to cover areas which are not assessable by conventional objectivised assessment tools is appropriate. There is plenty of evidence in literature to suggest that expert subjective assessments can be as reliable as highly objective ones.[16]

The IA of broader specialties should also include marks from all the allied specialties e.g. General Medicine should include marks of Psychiatry, Dermatology, Venereology & Leprosy and Respiratory Medicine including tuberculosis, while General Surgery should include Orthopaedics, Dentistry, Anaesthesiology and Radio-diagnosis, so that students do not ignore these postings. The proportion of the marks for each allied specialty shall be proportionate to the time of instruction allotted to each. It may be noted that although very small contribution is being made by allied subjects, yet it serves as motivator to the students to not miss these postings. When subjects are taught in more than one phase, the assessment must be done in each phase and must contribute proportionally to final internal assessment.

Assessment of Foundation Course should be included in formative assessment of first phase. Assessment of ECE should be included in formative as well as in internal assessment in first phase subject wise. Assessment of electives should contribute to internal assessment in final phase part-II. *There should be at least one assessment based on direct observation of skills, attitudes and communication at all levels.* Communication and attitudinal assessment should also be built in to all assessments as far as possible**.** A log book must be used to record these components. **A sample format of log book is being published separately.**

Feedback in IA

Feedback should be provided to students throughout the course so that they are aware of their performance and remedial action can be initiated well in time. The

feedbacks need to be structured and the faculty and students must be sensitized to giving and receiving feedback.[11,12]

The results of IA should be displayed on notice board within two weeks of the test and an opportunity provided to the students to discuss the results and get feedback on making their performance better. Universities should guide the colleges regarding formulating policies for remedial measures for students who are either not able to score qualifying marks or have missed on some assessments due to any reason(s).

It is also recommended that students should sign with date whenever they are shown IA records in token of having seen and discussed the marks**. Internal assessment marks will not be added to University examination marks and will reflect as a separate head of passing at the summative examination.**

Record keeping

The peculiarities of CBA, particularly its longitudinal nature and its use as a measure of progression require a good record keeping. Such records can vary from manual to electronic. In whatever form they are used, the essential features should include regularity, availability to the students and a documentation of discussion on the results (present status, feedback and suggestions for improvement) between the student and the teacher(s). Many aspects can be covered in a group feedback while some will require one to one discussion. The formats for use in Indian settings have been published and can be suitably modified for local use.[12]

These concepts have been incorporated in the proposed GMER 2019 and are reproduced below.

Excerpts from proposed GMER 2019

11.1.1 (b) Internal Assessment: Internal assessment shall be based on day-to-day assessment. It shall relate to different ways in which learners participate in learning process including assignments, preparation for seminar, clinical case presentation, preparation of clinical case for discussion, clinical case study/problem solving exercise, participation in project for health care in the community, proficiency in carrying out a practical or a skill in small research project, a written test etc.

1. Regular periodic examinations shall be conducted throughout the course. There shall be no less than three internal assessment examinations in each Preclinical / Para-clinical subject and no less than two examinations in each clinical subject in a professional year. An end of posting clinical assessment shall be conducted for each clinical posting in each professional year.
2. When subjects are taught in more than one phase, the internal assessment must be done in each phase and must contribute proportionately to final assessment. For example, General Medicine must be assessed in second Professional, third Professional Part I and third Professional Part II, independently.
3. Day to day records and log book (including required skill certifications) should be given importance in internal assessment. Internal assessment should be based on competencies and skills.
4. The final internal assessment in a broad clinical specialty (e.g. Surgery and allied specialties etc.) shall comprise of marks from all the constituent specialties. The proportion of the marks for each constituent specialty shall be determined by the time of instruction allotted to each.
5. Learners must secure at least 50% marks of the total marks (combined in theory and practical / clinical; not less than 40 % marks in theory and practical separately) assigned for internal assessment in a particular subject in order to be eligible for appearing at the final University examination of that subject. Internal assessment marks will reflect as separate head of passing at the summative examination.
6. The results of IA should be displayed on the notice board within a 1-2 week of the test. Universities shall guide the colleges regarding formulating policies for remedial measures for students who are either not able to score qualifying marks or have missed on some assessments due to any reason.
7. Learners must have completed the required certifiable competencies for that phase of training and completed the log book appropriate for that phase of training to be eligible for appearing at the final university examination of that subject.

b. Summative assessment logistics (For Universities)

Summative assessment consists of University examinations. Each theory paper will have 100 marks. Marks distribution as per proposed GMER 2019 for various subjects in given in Table 2.

Table 2: Marks distribution for various subjects in University examinations

Phase of Course	**Written-Theory – Total**	**Practicals / Orals/ Clinicals**	**Pass Criteria**
First Professional			<u>Internal Assessment:</u> 50%combined in theory and practical (not less than 40% in each) for eligibility for appearing for University Examinations <u>University Examination</u> Mandatory 50% marks in theory and practical (practical = practical/ clinical + viva) [theory=theory paper(s) only] Internal assessment marks are not to be added to marks of the University examinations and should be shown separately in the grade card.
Human Anatomy - 2 papers	200	100	
Physiology - 2 papers	200	100	
Biochemistry - 2 papers	200	100	
Second Professional			
Pharmacology - 2 Papers	200	100	
Pathology - 2 papers	200	100	
Microbiology - 2 papers	200	100	
Third Professional Part – I			
Forensic Medicine & Toxicology - 1 paper	100	100	
Ophthalmology – 1 paper	100	100	
Otorhinolaryngology – 1 paper	100	100	
Community Medicine - 2 papers	200	100	
Third Professional Part – II			
General Medicine - 2 papers	200	200	
General Surgery - 2 papers	200	200	
Pediatrics – 1 paper	100	100	
Obstetrics & Gynaecology - 2 papers	200	200	

As per proposed GMER 2019, University examinations will be held in the month of September for first & second phase and October for final phase part 1. The examination for final phase part II will be held in the month of January (Table 3).

Table 3: Examinations schedule

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
							Foundation Course	I MBBS			
I MBBS								Exam I MBBS	II MBBS		
II MBBS								Exam II MBBS	III MBBS		
III MBBS Part I									Exam III MBBS Part I	Electives & Skills	
III MBBS Part II											
Exam III MBBS Part II		Internship									
Internship											

Theory question paper (Knowledge part)-For Universities and colleges

Universities should instruct paper setters to follow guidelines for paper setting as given below:

1. Follow MCI competencies for paper setting in the subject.
2. Designing of question paper should take into consideration all levels of knowledge domain e.g. Bloom's taxonomy of cognitive domain. Use appropriate verbs for the questions at each level to assess higher levels of learning.[17] An example is given below in Table 4. Use combination of various types of questions e.g. structured essays (Long Answer Questions - LAQ), Short Answers Questions (SAQ) and objective type questions (e.g. Multiple Choice Questions - MCQ). Marks for each part should be indicated separately. MCQs if

used, should not have more than 20% weightage. Example of theory paper and some examples of questions are given in Annexure 2**.**

3. The question paper setter must sample the contents appropriately from competencies. The blueprinting grid can help the paper setters to balance the question papers in content related aspects as depicted below in Table 5. Blueprinting will add to the value and quality of these assessments. Moderation of theory question paper by subject expert must be arranged by Universities.

Table 4: Verbs in various levels in Knowledge domain (Bloom's taxonomy)[17]

Level	Suggested Verbs
Knowledge	Define, Describe, Draw, Find, Enumerate, Cite, Name, Identify, List, label, Match, Sequence, Write, State
Comprehension	Discuss, Conclude, Articulate, Associate, Estimate, Rearrange, Demonstrate understanding, Explain, Generalise, Identify, Illustrate, Interpret, Review, Summarise
Application	Apply, Choose, Compute, Modify, Solve, Prepare, Produce, Select, Show, Transfer, Use
Analysis	Analyse, Characterise, Classify, Compare, Contrast, Debate, Diagram, Differentiate, Distinguish, Relate, Categorise
Synthesis	Compose, Construct, Create, Verify, Determine, Design, Develop, Integrate, Organise, Plan, Produce, Propose, rewrite
Evaluation	Appraise, Assess, Conclude, Critic, Decide, Evaluate, judge, Justify, Predict, Prioritise, Prove, Rank

Table 5: Blueprinting in knowledge domain

(Representative example only. Actual figures may vary with the subject and Phase)

Level	Topic A	Topic B	Topic C	Topic D	Total
Knowledge	1	2	1	1	5 (20%)
Comprehension	1	1	1	2	5(20%)
Application	2	1	1	1	5 (20%)
Analysis	1	1	2	2	6(24%)
Synthesis		1		1	2 (8%)
Evaluation	1		1		2 (8%)
Total	6(24%)	6(24%)	6(24%)	7(28%)	25 (100%)

Practical/Clinical examination

This part should include assessment in psychomotor and affective domain. Assessment of clinical and procedural skills should be based on direct observations by the examiners. Avoid making this assessment mainly targeted to knowledge domain only. e.g. by asking a learner in a room away from actual patient, “how history was taken”. Instead, learner should be observed while he/she is taking history.

The competencies dealing mainly with skills and affective domains in each subject must be included. Many of the tools mentioned for formative assessment may not be usable / feasible at the University examinations e.g. mini-CEX. However, multiple tools like case presentations, OSCE and/or OSPE should be employed.[11,14,18-22.] The value of conventional case presentation should be improved by having 1 or 2 longer (15 minutes or so) OSCE type stations, where examiners can observe and assess complete history taking (e.g. family history, present history etc.) and/or physical examination skill. This can be done either with check lists or using global ratings. Not only will this improve the validity of case presentations, but also provide an opportunity to assess attitudes and communication in context.

Pre- and para-clinical departments should make practical exercises application oriented. Objective Structured Practical Examination (OSPE), One-Minute Preceptor (OMP), Directly Observed Procedural Skills (DOPS) etc. can be suitably modified for this purpose. Practical tests should not become simply tests of knowledge.

Multiple teachers should be involved in assessment. This will help in not only taking care of subjectivity but also provide much needed training in assessment to senior residents and assistant professors.

The use of multiple methods, by multiple examiners in multiple settings to assess multiple competencies, blueprinting and longitudinal assessment help to improve the reliability and validity of assessment.[6, 18,23]

The relevant provisions from proposed GMER 2019 and are reproduced below:

Excerpts from proposed GMER 2019

University Examinations

11.2.1 University examinations are to be designed with a view to ascertain whether the candidate has acquired the necessary knowledge, minimal level of skills, ethical and professional values with clear concepts of the fundamentals which are necessary for him/her to function effectively and appropriately as a physician of first contact. Assessment shall be carried out on an objective basis to the extent possible.

11.2.2 Nature of questions will include different types such as structured essays (Long Answer Questions - LAQ), Short Answers Questions (SAQ) and objective type questions (e.g. Multiple Choice Questions - MCQ). Marks for each part should be indicated separately. MCQs shall be accorded a weightage of not more than 20% of the total theory marks. In subjects that have two papers, the learner must secure at least 40% marks in each of the papers with minimum 50% of marks in aggregate (both papers together) to pass.

11.2.3 Practical/clinical examinations will be conducted in the laboratories and /or hospital wards. The objective will be to assess proficiency and skills to conduct experiments, interpret data and form logical conclusion. Clinical cases kept in the examination must be common conditions that the learner may encounter as a physician of first contact in the community. Selection of rare syndromes and disorders as examination cases is to be discouraged. Emphasis should be on candidate's capability to elicit history, demonstrate physical signs, write a case record, analyze the case and develop a management plan.

11.2.4 Viva/oral examination should assess approach to patient management, emergencies, attitudinal, ethical and professional values. Candidate's skill in interpretation of common investigative data, X-rays, identification of specimens, ECG, etc. is to be also assessed.

11.2.5 There shall be one main examination in an academic year and a supplementary examination to be held not later than 90 days after the declaration of the results of the main examination.

11.2.6 A learner shall not be entitled to graduate after 10 years of his/her joining of the first part of the MBBS course.

11.2.7 University Examinations shall be held as under:

(a) First Professional

1. The first Professional examination shall be held at the end of first Professional training (1+12 months), in the subjects of Human Anatomy, Physiology and Biochemistry.
2. A maximum number of four permissible attempts would be available to clear the first Professional University examination, whereby the first Professional course will have to be cleared within 4 years of admission to the said course. Partial attendance at any University examination shall be counted as an availed attempt.

(b) Second Professional

1. The second Professional examination shall be held at the end of second professional training (11 months), in the subjects of Pathology, Microbiology, and Pharmacology.

(c) Third Professional

1. Third Professional Part I examination shall be held at end of third Professional part 1 of training (12 months) in the subjects of Ophthalmology, Otorhinolaryngology, Community Medicine and Forensic Medicine and Toxicology
2. Third Professional Part II - (Final Professional) examination shall be at the end of training (14 months including 2 months of electives) in the subjects of General Medicine, General Surgery, Obstetrics & Gynaecology and Pediatrics. The disciplines of Orthopaedics, Anaesthesiology, Dentistry and Radiodiagnosis will constitute 25% of the total theory marks incorporated as a separate section in paper II of General Surgery.
3. The discipline of Psychiatry and Dermatology, Venereology and Leprosy (DVL), Respiratory Medicine including Tuberculosis will constitute 25% of the total theory marks in General Medicine incorporated as a separate section in paper II of General Medicine.

9. **Capacity building**

Considering the importance of CBA in making competency based curriculum a success, preparing the faculty to decide and use appropriate tools is crucial. Faculty needs to move beyond 'conventional' assessment methods. It is also important to remember that usefulness of many newer tools depends on the way they are used. Faculty also needs to be trained to develop their own toolbox depending on resources, expertise and contextual factors.

The revised Basic Course Workshop (rBCW) in Medical Education Technologies provides training in tools to be used for lower two levels of Miller's pyramid while the Advance Course in Medical Education (ACME) trains in those for higher two levels. In addition, the trained faculty and Medical Education Units should have in-house programs to build capacity for assessment. Involving junior faculty in IA is a useful step to provide hands-on training in assessment. Sensitization and training of all stakeholders at the University and Institutional level is required.

It is equally important to involve the student community and make them aware of these changes. Many changes require a variance from established practices. Foundation course and introductory sessions in each department should orient the students to the changes in assessment.

10. Implementation & Monitoring / Curricular Governance

Internal assessment formats are to be developed by institutes as per proposed GMER 2019. The changes in summative assessment (university examination) are to be adopted by universities and details to be provided to the affiliated colleges. Quality assurance techniques in formative assessment (self / peer monitoring) and University examinations (question paper moderation by subject experts, external monitoring or posting external observers/examiners) should be employed to improve assessment.

11. **Examples / Models**

The suggested formats are provided in annexures.

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Annexure 1

Suggested phase wise scheduling of tests for internal assessment for Colleges

(This is only a suggested sample plan. Local changes can be made if they conform to proposed GMER 2019)

Phase	Minimum Number of tests during the year	Remarks
1st	Human Anatomy 3, Physiology 3, Biochemistry 3, Community Medicine 1	•ECE assessment should be included subject wise •There should be at least one short question from AETCOM in each subject •One of the 3 tests in preclinical subjects should be prelim or pre-university examination
2nd	Pathology 3, Pharmacology 3, Microbiology 3, Two tests for- General Medicine (Including Psychiatry, Dermatology, Venereology & Leprosy (DVL) and Respiratory Medicine including Tuberculosis), General Surgery (Including Orthopaedics, Dentistry, Anaesthesiology and Radiodiagnosis), Obstetrics& Gynaecology, Forensic Medicine & Toxicology and Community Medicine End of posting (EOP) examination at each clinical posting including those of allied subjects	•Clinical subjects should also be assessed at end of each posting (EOP) – Theory and Practical •There should be at least one short question from AETCOM in each subject •One of the 3 tests in Para-clinical subjects should be prelim or pre-university examination

3rd	Forensic Medicine &Toxicology 2, Community Medicine 2, Ophthalmology 2, Otorhinolaryngology 2 Two tests for- General Medicine (Including Psychiatry, Dermatology, Venereology & Leprosy (DVL) and Respiratory Medicine including Tuberculosis), General Surgery (Including Orthopaedics, Anaesthesiology and Radiodiagnosis), Pediatrics, Obstetrics &Gynaecology EOP examination at each clinical posting including allied subjects	•Clinical subjects should also be tested at end of each posting (EOP)-Theory and Practical •There should be at least one short question from AETCOM in each subject •One of the tests in Ophthalmology, Otorhinolaryngology /Forensic Medicine & Toxicology/ Community Medicine should be prelim or pre-university examination
4th	Two Tests for- General Medicine (Including Psychiatry, Dermatology, Venereology & Leprosy (DVL) and Respiratory Medicine including Tuberculosis), General Surgery (Including Orthopaedics, Anaesthesiology and Radiodiagnosis), Pediatrics, Obstetrics & Gynaecology EOP examination at each clinical posting including that in allied subjects	•Clinical subjects should also be tested at end of each posting (EOP)-Theory and Practical •There should be at least one short question from AETCOM in each subject •One of the tests in General Medicine, General Surgery, Pediatrics and Obstetrics & Gynaecology should be preliminary or pre-university examination •Assessment of electives to be included in IA

AETCOM: Attitude, Ethics and Communication

The internal assessment marks for each subject will be out of 100 for theory and out of 100 for practical/clinical (except in General Medicine, General Surgery and Obstetrics & Gynaecology, in which theory and clinical will be of 200 marks each). Internal assessment marks will reflect as a separate head of passing at the summative examination and will not be added to the University marks.

Twenty five percent of weightage in theory tests in General Medicine and General Surgery should be given to allied subjects and there should be at least one question from each allied subject.

Annexure 2

Examples of theory questions

Sl. No.	Type	Explanation	Examples
1	Long essay question	The question should pose a clinical/practical problem to the students and require them to apply knowledge and integrate it with disciplines. Avoid giving one liners as questions. The question stem should be structured and marking distribution should be provided. Use action verbs from higher domains as given in this document. Please avoid simple recall based questions. What is asked in the examination generally sets the agenda of what and how the students learn.	A 6 days old term neonate has presented with jaundice noted at 3 days of age. He is born out of normal delivery at home. On examination, he looks pale, has a liver of 5cms and spleen of 2 cms. Other systemic examination is normal. a. What is your provisional diagnosis? b. Which other conditions need to be considered? c. Enumerate the lab tests that you will order and their likely reports in each of the diagnosis that you considered. d. Explain the physical findings in the light of underlying derangements. - Describe the clinical features, complications and management of type 2 diabetes mellitus. (3+3+4=10)

Sl. No.	Type	Explanation	Examples
2	Short notes	These provide opportunity to sample a wider content, albeit in a short time. The questions should be task oriented rather than Write a short note on xxx. (Two questions based on ECE in Phase 1 in internal assessment) (Two questions based on integration in Phase 2 & 3 in internal assessment)	1. What are the various ways in which acute glomerulonephritis can present during childhood? 2. What is the role of antibiotics in childhood diarrhoeas? 3. What is the utility of routine vitamin K administration during newborn period? 4. Compare and contrast the use of ramipril and amlodipine in treatment of hypertension.
3	Reasoning Questions	These provide excellent opportunities for testing integration, clinical reasoning and analytic ability of the student.	1. Which components of breast milk help in prevention of neonatal infections? How do they help in prevention of infection? 2. Plan immunization for a 2 years old totally un-immunized child. 3. What is the physiological basis of origin of respiratory sounds? How can they help us in making a diagnosis? 4. Explain why adrenaline is the preferred medication in anaphylactic shock.

Sl. No.	Type	Explanation	Examples
4	Short notes Applied aspects	(Pre- & Para-Clinical subjects: questions on applied aspect) (Clinical subjects: questions on preclinical basis)	**Pre & Para-Clinical subjects:** Describe clinical significance of half-life of drugs. **Clinical subjects:** Explain patho-physiological basis of clinical features of heart failure
5	Short notes AETCOM	(one question on AETCOM in all subjects in all phases)	Pharmacovigilance program of India **AETCOM**: What are the rights of a patient in a hospital setting
6	MCQs	MCQs should be scenario based, single response with 4 options in answers. Avoid one liner and negative terms in stem of question. Avoid 'all of above' and 'none of above' in options.	1. A 25 year old lady was using oral contraceptives successfully for last two years. She got tuberculosis and was prescribed Rifampicin. She became pregnant after 2 months of starting Rifampicin despite continuing the oral contraceptives. Which of the following effects of Rifampicin can be the reason for this? A. Induction of oral contraceptive metabolism B. Stimulation of ovulation C. Interruption of entero-hepatic circulation D. Increased excretion of oral contraceptives Key: A

Sl. No.	Type	Explanation	Examples
	MCQs		2. A 2 year old child presents with excessive weight gain over last 1 week. He has puffy eyes, pitting edema and normal blood pressure. Urine examination shows no RBCs but massive proteinuria. Which of the following biochemical parameters is likely to be elevated in this child? a. Urea b. Cholesterol c. Creatinine d. Uric acid Key B 3. Which of the following term best describes the decreased effects of beta adrenergic agonists in bronchial asthma after long term use? A. Pharmacokinetic tolerance B. Pharmacodynamic tolerance C. Tachyphylaxis D. Drug dependence Key: B

Note: AETCOM question should be based on competencies (primarily knowledge based) acquired during the AETCOM module training. At least one question in each paper of the clinical specialties should test knowledge - competencies acquired during the professional development programme (AETCOM module); Skills competencies acquired during the Professional Development programme (AETCOM module) must be tested during clinical, practical and viva.

In subjects that have two papers, the learner must secure at least 40% marks in each of the papers with minimum 50% of marks in aggregate (both papers together) to pass in the said subject.

NATIONAL MEDICAL COMMISSION

COMPETENCY BASED UNDERGRADUATE CURRICULUM FOR THE INDIAN MEDICAL GRADUATE

Knows Knows how Shows Shows how Performs

Describe Enumerate Observe Demonstrate Assist

Counsel Prescribe

Analyse Integrate

Guide Communicate

Correlate Interpret

Critique Collaborate

Online learning & Assessment Module 8

Clinician Communicator Team Leader Professional Lifelong Learner

Knowledge | Skills | Attitude | Values | Responsiveness | Communication

Curriculum Implementation Support Program

Module on

Online

Learning and Assessment

2020

National Medical Commission

Pocket-14, Sector-8, Dwarka,
New Delhi 110 077

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Foreword
Online learning and Assessment

The COVID- 19 pandemic in many ways has challenged educators to innovate and ensure that the medical students are able to continue their learning during a situation that has placed an unprecedented strain on the medical education system. Creating a learning experience that allows learners to accomplish the required competency online, many of which are skill and attitude based, is a tough ask. Despite this, many institutions have risen to the challenge and displayed ingenuity in creating a learning environment that fulfils many of the demands of medical education.

Online learning, while not without its drawbacks, has some significant strengths that warrant its continuation in some form beyond these tough times. Flexible learning opportunities, greater learner involvement, impetus to self-directed and collaborative learning are some of the obvious strengths of online learning. Blended learning is going to be the future of medical education.

This module prepared by the Expert Group with inputs from outside experts is a primer of how to improvise at times of necessity and demand. It provides guidance to Curriculum Committee of medical colleges and to the teachers on how to use the online medium to help learners achieve many of the stated competencies including procedural skills and Attitude, Ethics and Communication skills which are traditionally considered not amenable to distance learning. Many of these modalities require very little monetary investment. Wherever possible - low cost alternatives to paid premium platforms - such as open access and free to use resources have been outlined.

Online medical education is nascent - and is fertile with innovations happening in all the medical institutions in the country. I request all the institutions in the country to share their best practices in a spirit of collaboration and ensure that our students get to learn in an environment - real or virtual - that best allows them to fulfil their aspirations. I am grateful to the Expert Group for preparing this learning module on Online learning and assessment which is of current relevance.

Chairman
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राष्ट्रीय आयुर्विज्ञान आयोग
National Medical Commission

Foreword
Online learning and Assessment

The implementation of the new competency based Undergraduate curriculum across medical colleges in India required training of medical college teachers in the various changes built into this outcome-driven new curriculum, year-wise. To achieve this, the Expert Group, advising academic matters, developed a sequential step-wise Curriculum Implementation Support Program (CISP) which included a number of training modalities like Faculty Guides, Learning Resource materials and in-situ training of teaching faculty of colleges through a multi-tier Faculty Development Program. The successful implementation of CISP I in the first year of teaching of the new UG curriculum was a major achievement.

The COVID-19 outbreak in early 2020 posed a major setback to our efforts to train medical college faculty on the changes incorporated in the second year of the new UG curriculum wherein the major challenge of horizontal and vertical integration of curricula were built in,in addition to new teaching learning modalities like Learner-doctor method of clinical training (Clinical Clerkship). This challenge forced the Academic cell and the Expert Group advising the National Medical Commission to explore Online teaching-learning and assessment modalities. This module on Online learning and Assessment is the outcome of these efforts and provides valuable and much needed information to medical college faculty. I hope the information contained herein will be useful to students, teachers and institutions interested in virtual teaching.

Vats

Secretary
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Module on
Online
Learning and Assessment

Glossary

AETCOM: Attitude, Ethics and Communication module introduced into its Faculty Development Program by the Medical Council of India in 2015 for undergraduate medical education.

Asynchronous learning: A learning event in which teachers and students participate at different times. Generally, there is no real-time interaction between the teacher and the students.

Blended learning: Learning which integrates online learning with conventional face-to-face (f2f) teaching. Also called **'hybrid learning'**.

Distance learning: A form of remote teaching-learning method where media replaces word of mouth as the sole means of academic communication. There is often a spatial distance between the teacher and the student.

E-learning: Teaching-learning which is delivered using electronic resources. The teacher and the student may be within the same classroom or at a remote location.

Flipped classroom: An approach where the conventional sequence of teaching-learning activities is reversed. Students read the material at home *before the class* and then use the classroom time to discuss, clarify concepts, create and apply knowledge.

Online Learning: Teaching-learning interactions which take place over the internet. This term is conventionally used for learning that happens across a distance. Learning can happen either partially or purely through the internet.

Pedagogy: Theory and practice of education.

Synchronous learning: A learning event in which teachers and learners engage at the same time. The place may be same or different. It is conventionally used in the context of online learning.

Disclaimer

Mention of/or example of a technology, platform or app for online teaching and assessment is not to be seen as an endorsement of the same.

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Introduction to online learning

The Covid-19 pandemic has dramatically changed the medical education environment and made the shift to online learning inevitable. Close human contact that was the essence of clinical teaching now looks so distant. The current coronavirus pandemic has forced us to explore non-conventional ways of teaching-learning and assessment. Medical schools will now need to be prepared to train the next generation of digital learners using virtual learning environments. This does not mean that traditional classroom teaching will become obsolete, but there is now an opportunity to use both methods efficiently in a hybrid manner, to make the process of learning efficient and effective.[1]

Though online learning has been in vogue for many years now, its application in medical education, especially in India, is rather new. Some teachers have had the experience of online learning – some as facilitators, and others as 'students' – during earlier faculty development interventions[2-3]; but its use for undergraduate education is a relatively new phenomenon.

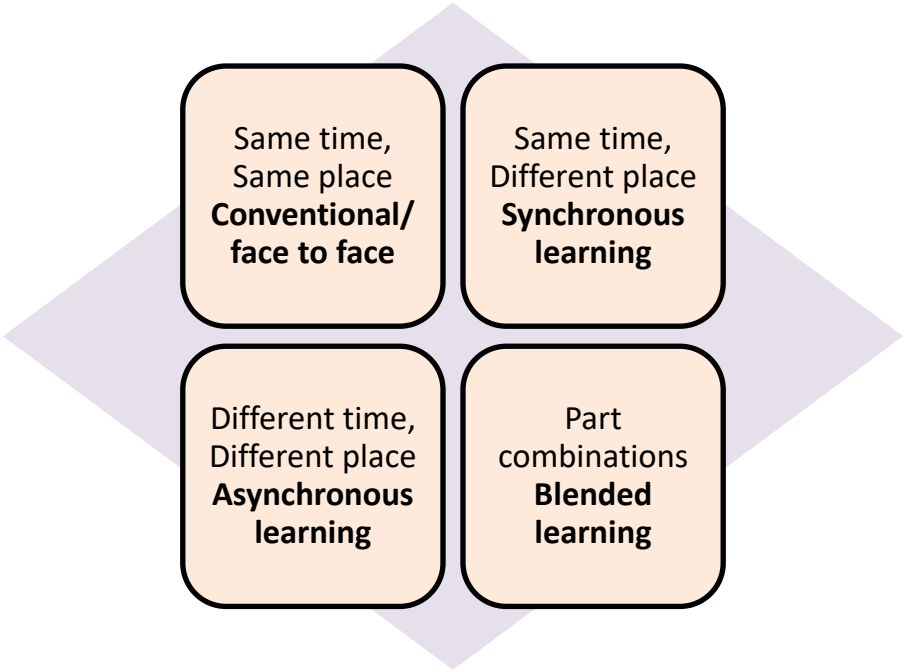
The 'theory' of online learning is more or less the same when compared to face-to-face (f2f) instruction, but there are subtle differences and similarities. The educational cycle, the learning processes, need for interactivity, integration, assessment and feedback are similar in both formats. The use of technology, the spatial distance between the teacher and students, and learner isolation stand out as prominent differences.

Different people have different ideas, interpretations and perspectives about online learning. Depending on the purpose, technology, context and institution, various terms such as e-learning, distance learning, web-based learning, web-facilitated learning, virtual learning, internet learning, distributed learning, computer-based learning, and technology-based learning have been used rather loosely and interchangeably to denote non face-to-face (f2f) learning.[4-7]

Means et al[8] define online learning as "*'learning that occurs entirely (purely online learning) or partially (blended learning) through the internet"* and this is the definition we are going to use in the context of this module.

The most accepted typology of online learning is given in Figure 1.

Fig.1: Typology of online learning (Modified from Coldeway, 1995)[9]



Blended learning is a teaching-learning format where the facilitator effectively integrates the online teaching component with face-to-face sessions. For the purpose of this module, blended learning has been taken as: *"Seamless integration of traditional face to face learning with online activities to enhance the learning experience".*

Online learning: What works, what doesn't

Several factors influence the effectiveness of online learning. These factors include technical skills, academic skills, learner motivation, administrative issues, social interaction, time management, technical problems, cost, and accessibility to the internet.[10] Poor design of courses and inadequate availability of multimedia materials could affect the quality of online training. Online learning has been reported to be as effective as didactic teaching. It can also be instrumental in promoting self-directed learning. Learners can have greater control over their learning as they can go over the content at their own pace. Teachers too can evaluate competencies through online assessments and provide learners feedback for self-improvement.

If faculty in higher education are not adequately trained in educational methods, the problem of ineffective teaching gets exaggerated during online sessions as it has special requirements.[11] Online teaching requires a learner-centered approach, where teachers

need to be competent in using principles of pedagogy, constructive and transformative learning, and assessment and feedback.[12]

Online learning formats

Online learning platforms now offer many opportunities that are being widely used around the world, such as online videos, tutorials, webcasts, video-conferences and virtual simulations. Online teaching-learning can be implemented through **synchronous** or **asynchronous modes**.

The range of available choices for real-time communication extends from online discussion spaces to online chat rooms to online meeting applications. Classroom lectures have now been replaced by live-streamed online lectures, where technology allows recording and online dissemination. Small group discussions and tutorials have been replaced with interactive webinars using online platforms. Almost all these learning resources can also be easily accessed using smartphones.

Information or learning resources can be posted on online platforms, such as websites and blogs. Videos can be shared to demonstrate essential clinical skills, procedural skills or communication skills. Lectures, problem-based learning, simulated lab work, sessions using virtual patients, and discussions can be conducted online, both in synchronous and asynchronous mode. All of these, if used effectively, can build in student engagement and interaction.

Online learning offers flexible learning experiences and allows learners the freedom to experiment with learning at their own pace. It is however not a replacement for f2f teaching.[13] It is initially expensive to set up and requires familiarity with technology.[14]

What the future holds for online learning in India

Although the recent surge in use of online learning has been propelled by the Covid-19 pandemic, it is likely to be adopted as a regular part of teaching and learning in the future as well. Furthermore, newer modes of health care delivery are evolving with rapid advances in information technology. Online learning promises to play a major role in this backdrop.

The recently introduced, competency-based curriculum in India already advocates use of e-learning as a tool for encouraging self-directed learning among students. The CBME document of Medical Council of India (2018)[15] recommends e-learning at the following junctures:

Table 1: Emphasis on online learning in the recently introduced competency-based curriculum

- As a lifelong learner, the Indian Medical Graduate is expected to "*demonstrate ability to search (including through electronic means), and critically evaluate the medical literature and apply the information in the care of the patient*"
- One of the objectives of Foundation Course is to "*to enable the learner to acquire enhanced skills in use of information technology*"
- The new curriculum has reserved time for self-directed learning during every phase of the MBBS course
- The document recommends mandatory provision of skills laboratory in every medical college
- It also recommends mandatory provision of virtual lecture theatres

In addition, medical students also need to develop certain skills, collectively called 21st century skills[16] to fully benefit from online instruction. They need to have digital literacy skills. While students in general are comfortable working with computers and other digital platforms, a deliberate effort must be made to inculcate information technology related literacy, which includes, accessing information, evaluating it critically, and its application to address a given problem. Readers would recall that the Foundation Course introduced from 2019 admissions tried to address many of these issues.

The Pedagogy of Online Learning

Pedagogical approaches which are used for face to face (f2f) teaching might not work if replicated in online settings. It is time to re-conceptualize pedagogical approaches for online teaching.[17]

Table 2: Pedagogical approaches to be used in online learning

1. *Online learning must not be restricted to delivery of information:* Online methods should not merely be used as tools to distribute teachers' notes or PowerPoint slides.

2. *Online tools must be used to innovate and create knowledge*: Online teaching must address higher-order cognitive skills. It must promote creativity, innovation, critical thinking and problem-solving skills in undergraduate medical students.

3. *Online tools must be explored to teach all domains*: Ways and means to teach psychomotor skills, communication skills, ethics, and medical humanities via online mode must be explored.

4. *Online approaches used must encourage participation and collaboration*: Online learning must be conducted through 'involvement' and 'inclusiveness' of the learners. This will also reduce learner isolation.

5. *Feedback, support and mentoring of learners must be carried out:* Learners in online sessions need more interactivity, mentoring, support, feedback and evaluation than the traditional classrooms. Communication between facilitators and learners must be encouraged.

6. *Online teaching must be supplemented by online assessment:* Periodic formative and summative assessment must be built into online courses.

7. *Quality assurance of online teaching and learning must be monitored:* Quality assurance in online teaching must be adopted within the institutional policy document.

Building student engagement online

Here are some tips for building learner engagement in online sessions which work both in synchronous and asynchronous modes:

a. **Allow students to do most of the work**: It is important to give students time to engage and interact with the content. Student should be taught to take up responsibility for their own learning. This must be supplemented by facilitating discussions amongst students, and by giving them collaborative projects.
b. **Interactivity is the heart and soul of effective learning**: Students must be given opportunities to interact with the content, teacher, peers, environment and context; and
c. **Strive for presence**: Teachers should strive to ensure the following three types of presence in their online sessions:

Table 3:

Enhancing effectiveness of online teaching by ensuring cognitive, teaching and social presence

Type of presence	Examples
Cognitive presence (Related to content)	• Select suitable content • Arrange from simple to complex • Introduce content in bite-sized modules • Introducing conceptual and theoretical knowledge into discussions
Teaching presence (Related to instructor)	• Facilitating discussions • Acknowledge and encourage students' contribution • Identify areas of agreement and disagreement • Respond to technical concerns • Set the appropriate climate for learning
Social presence (Related to interaction)	• Allow students to express emotions • Ask for evidence of reading, thinking and understanding others' responses • Build cohesiveness amongst learners by given group work and allowing student-student interactions

(Adapted from Garrison et al[18], and Pelz[19])

Good Online Teaching Practices

The principles for good teaching offline[20-21] and online[1] have been enlisted in literature. These principles reflect the basic premise of alignment between objectives, teaching-learning and assessment methods, need to promote interactivity, use of assessment, feedback, collaborative work, self-directed learning and promotion of higher order thinking skills using online pedagogical approaches.

Table 4: Good Online Teaching Practices

Principle 1: *Teaching-learning methods must match curricular objectives and assessment*
Online pedagogy must be aligned with clear learning objectives, meaningfulness of content covered, the appropriateness of student activities, and the type of assessment.

Principle 2: *Synchronous and asynchronous teacher-student interaction must be encouraged*
Create supportive and non-threatening online environment. Open synchronous and asynchronous communication channels to encourage students to complete their work. This results in higher levels of achievement.

Principle 3: *Promote higher order thinking skills and communication skills*
Online pedagogy should include learning strategies that encourage demonstration of higher order thinking skills and communication skills.

Principle 4: *Teamwork and cooperation among students must be encouraged*
Online pedagogy must encourage collaboration and social interaction among students. This enhances their involvement in learning.

Principle 5: *Encourage active learning*
Teachers must incorporate authentic, problem-solving activities that augment student efforts to actively construct meaningful knowledge through interactivity and application in real-life situations.

Principle 6: *Encourage development of self-directed learning*
Online pedagogy should offer meaningful opportunities to students to bridge the knowledge gap by motivating and instilling responsibility in them. Resultantly, students will embark on significant self-directed learning.

Principle 7: *Opportunities for online summative and formative assessment must be provided*
Online courses should build in valid and reliable assessment periodically. This will provide learners timely feedback and ample opportunities to reflect on their progress.

Principle 8: ***Mechanisms for providing prompt feedback must be built into the course***
Students need appropriate, timely and specific feedback on their performance. Online pedagogy must provide opportunities for students to reflect on what they have learned, what they still need to know, and how to assess themselves.

Principle 9: ***Effective time management and timely task completion must be emphasized***
Learning to use one's time well is critical for students, more so in an online environment as there is no substitute for time on task. Due emphasis should be given to defining time expectations for students in order to establish the basis for high performance.

Principle 10: ***All stakeholders must communicate high expectations from students***
In an online setting, it is pertinent to set clear expectations for quality student performance. Clear and high expectations provide students with precise guidelines about the type and quality of work essential for proficient and timely assignment completion.

Principle 11: ***Respect diverse talents and ways of learning***
Students have a wide variety of learning styles and needs. Online pedagogy should carefully consider prior knowledge, cognitive processing, personality styles, beliefs about learning, and demographics.

Principle 12: ***There must be a robust mechanism for monitoring development and mentoring***
Online pedagogy must support continuous monitoring and mentoring so as to facilitate achievement of intended outcomes of online learning.

(Modified from Saiyad et al[1] with permission)

Teacher roles, competencies and skills required for online teaching

Good online teaching practices will also require faculty to develop competencies in three major areas: technology, subject expertise, and pedagogy. Technical support to develop and manage online teaching modules, time, and support to online teaching are other minor issues.

Table 5 below lists some of the expectations from teachers by students when going through online courses:

Table 5: Students' expectations during online courses

- Easy to follow course design and navigation
- Clear directions for activities and assessments
- Reasonably quick grading and feedback
- Regular communication from the instructors

Based on these needs, teachers need to perform the following roles and develop the required competencies to be effective at online teaching (Table 6):

Table 6: Teacher roles and competencies needed for online teaching

A: Roles:

- instructional designer
- content facilitator
- technologist
- process facilitator
- advisor or counselor
- assessor
- manager or administrator
- researcher

Goodyear et al[22]

B: Competencies

To perform the above roles, the following **competencies** will be required:

- Knowledge of the online process
- Technical skills
- Online communication skills
- Content expertise, and
- Personal attributes: inherent motivation, integrity, visible, responsive and approachable, organized, analytical, respectful, active, flexible, open, honest, compassionate and supportive, and ability to lead by example.

(*Salmon*[23]; *Keengwe et al*[24]).

Skills needed for online teaching

The teaching skills required in the context of online teaching include[25]:

a. ***Communication skills:*** The need for clear and concise instruction is important for online teaching. Teachers who are adept at face to face teaching may need to augment their communication skills to be good online teachers.
b. ***Technological skills:*** Skills specific to the medium and content being taught, general computer literacy to be able to use word processors, spread sheets and presentations are pre-requisites for online teaching. For using simulations, additional skills may be required.
c. ***Pedagogical skills*****:** Online is only a medium for academic exchange - it requires a full complement of teaching skills, including generating learning objectives, matching content and mode to objectives, promoting interactivity, assessment and feedback, classroom management, and mentoring. A particular mention must be made of the skills of the teacher to engage the students who are physically separated from the teacher as well from peers and to encourage them to apply what they are being taught.
d. ***Design skills*****:** These include understanding and applying instructional design principles using learning materials in different formats. Teachers need to use student feedback to make changes in the format as well as ensure quality of learning.
e. ***Managerial skills*****:** Managing the classroom is as important in online teaching as it is in f2f situation. Ability to manage time, demonstrating leadership, managerial and mentoring skills, handling assignments and record keeping and following institutional, legal, ethical and professional requirements are some examples of these skills.[13]

Technology for online teaching

There have been rapid advances in technology used to deliver educational content, and now even social media platforms have started exploring educational needs. Moore's law,[26] which is often extrapolated to state that technology advances which almost doubles every eighteen months, suggests that training people in use of one technology will have limited effect. Further, with advances in technology, teaching methods are also expected to evolve (Table 7).

Table 7: Types of technology available in online courses

- **Websites and blogs** – access to stored information and repositories; electronic versions of scientific papers
- **Multimedia technology** – appropriate combination of video / still images and sound
- **Asynchronous modes** – like threaded discussions, assignments
- **Interactive resources** – providing real time interaction between teachers and students

Compatibility, accessibility, ease of use, user-friendly, opportunities for feedback are some of the criteria directing the choice and adoption of online platforms. While selecting a technological resource, the following points become important:

- Technology needs to be chosen depending on user needs, and not simply because it exists. Technology needs to be aligned to the learning objective.
- Technology has to be user-friendly to all stakeholders. This includes elements such as easy installation of software on computers, requirement of basic programming skills etc.
- Technology needs to be accessible and amenable to use in a variety of platforms, such as desktop computers, laptops, tablets and even smart phones.
- Technology needs to be compatible with the level of learners in terms of language and ease of learning to make it effective.
- Consideration of costs always determine feasibility of use of technology.

It is often useful to use a mix of appropriate technological resources which are available. This enables one to cater to online learners with a diverse variety of learning styles. This in turn helps students achieve desired learning outcomes.[27]

Pre-requisites to begin online teaching

To initiate online teaching, preparations will be required at all levels of stakeholders (teacher, learner, institution etc.). An important point is to ensure that all students have equal access to technology. So availability of enough computers and access to a high-speed internet connection on campus for all faculty and learners is an essential investment. The checklist to identify the pre-requisites in terms of infrastructure and support system that is required is given below (Table 8):

Table 8: Checklist to identify pre-requisites for initiating online teaching

1. Besides generalized IT support, does the institution have a separate cell to provide technical support to online learning activities?
2. Has a Committee been formed to coordinate and monitor online teaching in the institute?
3. What learning management system and software packages has the institute installed?
4. Is high speed internet freely available on campus?
5. Do all faculty and learners have access to laptops and/or smart phones?
6. Do all faculty and learners have individual and unique log-in IDs and passwords to access the learning management system?

(Modified from Brenton[28])

7

A Coordination Committee formed for each phase of MBBS teaching and headed by the MEU will be useful to monitor the quality of online teaching. Further, it may be useful to decide the workload and number of online sessions given to students each week, at the inter-departmental level. It is important not to subject them to cognitive overload as the attention span of students in online sessions can be pretty short.

Tools for online teaching

- **Online collaboration tools**: These enable the teacher and learner to upload and access lessons and assignments online. Texts, documents, images and videos can be shared, viewed and also edited in real time. Tools included in Google Apps and Google Classroom are a wonderful medium to brainstorm and simultaneously document the work of both the instructor and learner. Other tools available for online learning are Google Meet, Zoom, Cisco Webex, Free conference call, Microsoft teams, Go to meeting etc.

- **Presentation software:** Widely used tools such as Microsoft PowerPoint and Google Slides are an excellent means to augment lecture content by embedding high resolution images, diagrams, animation, audio and video files.
- **Course management platforms:** This is also known as Learning Management Systems (LMS). These platforms allow stakeholders to organize all resources needed for a class in terms of the syllabus, document sharing, audio and video files, assignment announcement and submission, discussion boards, online quizzes, grading tools, etc. Canvas is one such example. Some of the widely known online learning management tools are Swayam, Moodle, Google Classroom, Coursera, Clinical Key, Udemy, Teachable among many others.
- **Audience response systems:** These are easy and quick ways to connect with learners and gauge their learning in order to adjust the pace of teaching to learner requirement. This was usually done through clickers in a traditional classroom. A more popular option now is with use of software and applications which enable one to embed interactive polls between presentations, and gather responses through smart phones, which can be displayed in real-time to learners.
- **Lecture-capture tools:** Instructors are able to record their lectures on their local devices without additional requirements and upload them for learners. Such tools are useful for their ability to provide the learner with opportunities to review the content at their own time, pace and frequency. Studies have shown that such tools only augment the teaching-learning process rather than diminish student attendance.

Best practices in selecting appropriate technology

Radical changes in application of technology are already reshaping all areas of teaching and learning.[29]. Traditional forms are being challenged and massive online open courses (MOOCs) are paving their way in. Nevertheless, a visible disconnect exists between technologies, research, design and practice.[30]

Quite often, you will find instructors using fancy technology simply because it exists. There might be no need to use complex technology where a simple discussion or a simple reading might suffice. Technology is generally effective when the application directly supports the objectives and the purpose of the curriculum. Multimedia which simulates real-life situations will always be preferred, and it is best if they are tailored to the local context.

Here is a list of do’s and don’ts that can help one use technology in an optimal manner (Table 9):

Table 9: Some do's and don'ts when using technology in online teaching	
Do's	**Don'ts**
Choose and integrate appropriate technology that supports overall educational goals and curricular objectives.	Avoid using technology for the sake of using it, if it doesn't support the lesson plan. It is a costly mistake which must be avoided.
Train and encourage teachers to make judicious use of technology in their classrooms.	The role of technology should be to empower teachers and learners rather than to replace them.
Technology should be adjustable in terms of students' skills and abilities, provide feedback on progress, and give them enough opportunities to collaborate in the teaching-learning process.	Instructors should not be over-dependent on technology. No technology is foolproof, and technology depends on multiple external factors.
Ensure that teachers and learners are actively involved with a range of relevant and practical engagement techniques. Such strategies should become standard practice.	Mere use of technology doesn't necessarily guarantee engagement. Student engagement strategies will need to be built in while designing a lesson plan.
An optimal level of fidelity (realism) is preferred when using simulations. The degree to which technology simulates the intended task or environment must preferably match with the learner's expertise and the educational objectives of the module.	Every technology requires a minimum level of infrastructure, in terms of hardware and software tools or internet accessibility. Students with limited access to these technologies must also be considered during planning. Fair and equal access to all students is a pre-requisite for use of technology.

Implementing Online Teaching

Once the basic infrastructural requirements are in place, online learning can be implemented at institutions for individual batches. Preparation for online teaching at the level of the individual class can be divided into the following phases:

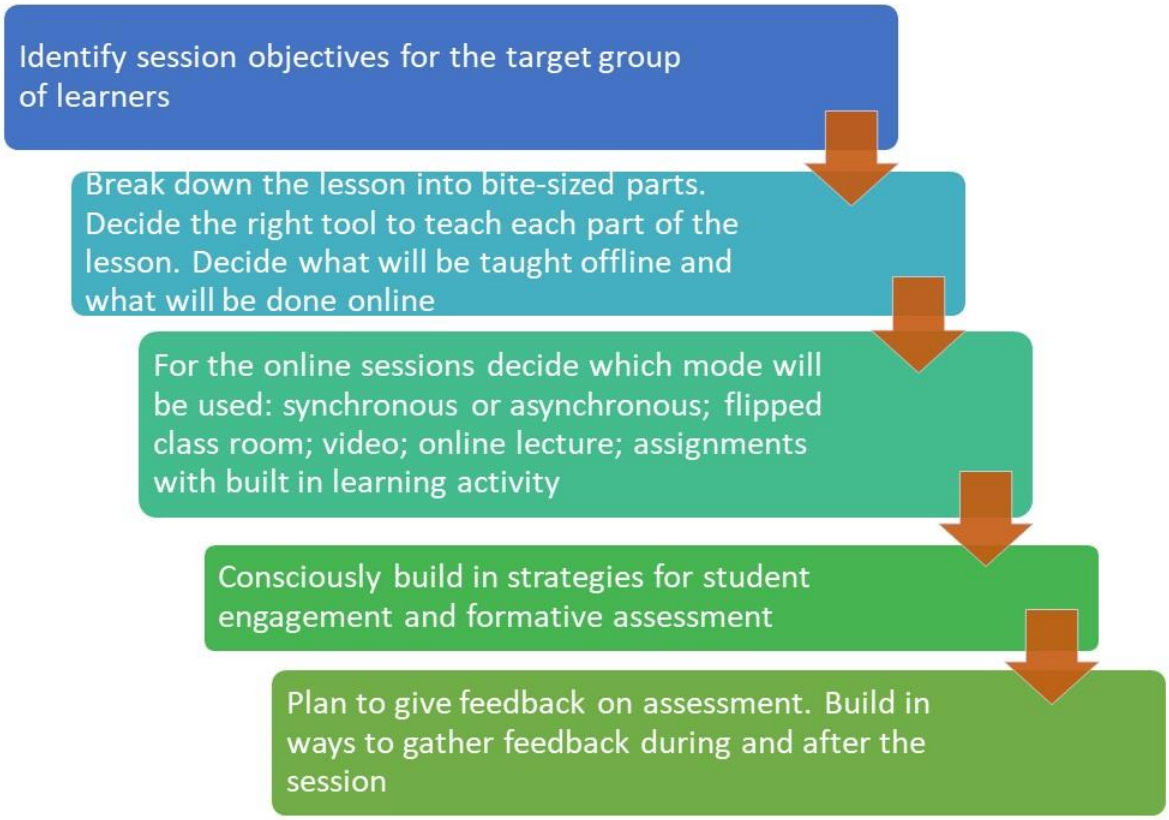
(a) Lesson planning
(b) Conducting online sessions
- Keeping students engaged
- Facilitating online discussions
- Managing Online classroom

(c) Post-session assessment and evaluation

A. LESSON PLANNING FOR ONLINE TEACHING

A well-designed lesson plan is key to the conduct of an effective online teaching session. Similar to any other teaching plan, if one identifies and aligns the 'golden triangle' of learning objectives, teaching-learning methods and assessment, the subsequent conduct of online teaching session will be a smooth affair. The following flow chart (Fig. 2) will help in preparing a lesson plan before actual conduct of online teaching session.

Fig. 2: Lesson planning for online teaching session



It is important to break the lesson into small bite-sized parts. It is important to be prepared with Plan B in case of technology glitches. Never feel embarrassed to accept the failure of technology system and be ready to plan the session on another day or with some other mode. Not everything needs to be delivered in the synchronous online mode. It is important to explore ways other than online lectures. It is best to use a mix of suitable methods to deliver content and make the content more relevant and interesting.

Table 10 lists some of the asynchronous methods to teach students online.

Table 10: Examples of asynchronous online teaching methods
• Send reading material and ask them to take a self-assessment • Assign video to watch and ask to submit related assessment • Ask learners to teach the class or conduct quiz • Share resources and ask learners to submit a project • Send learners on an online scavenger hunt: Ask them to search for credible literature on a specific topic • Give paper case and have a discussion online • Have a debate • Start a wiki • Give an experiential activity and ask learners to write reflections

The **flipped classroom** concept uses valuable synchronous time to clarify concepts, clear doubts and discuss the more in-depth issues of the topic, after the learners have learnt the basics on their own.

CONDUCTING ONLINE SESSIONS

Keeping students engaged

Keeping learners engaged is the most challenging part of online teaching as there is no face to face contact.

Table 11 lists some of the tips and strategies to keep learners engaged during the actual session.

Table 11: Tips and strategies to keep learners engaged
• Try and learn learners' names and use them • Build a rapport with learners: use formal and informal ways of interaction, model disclosure • Create the right environment for the class; build trust • Be available to answer questions and solve doubts • Introduce interactivity through online tools which enable conduct of polls, and gather real-time response • Embed multiple choice questions or quizzes between the session to gauge learning understanding • Ask how and why questions to challenge learners like you would be in a traditional classroom • Give opportunities for learners to ask questions and clarify their doubts • Check if the pace of the lesson is fine with the class • Use break-out rooms and give group work • Encourage discussions online

Questioning is one of the simplest ways of engaging with students. The art of questioning has to be learnt for use both in online and offline modes. Broadly, these questions are not meant to be graded, but used only as a tool to generate attention, promote thinking, link knowledge and promote application. Some of the types of questions used for this purpose (Table 12) are as follows:[31]

Table 12: Type of questions that can be used for student engagement	
Format of question	**Example**
Rhetorical question	Have you seen blood pressure being recorded? Let me show you.
Questions which generate interest	What would happen if you don't eat carbohydrates for 3 days?
Questions to ascertain baseline knowledge	Can someone tell the route of administration of BCG vaccine?
Questions to help the class recall already learnt facts	What is the daily protein requirement for a normal adult male?
Redirecting questions	We learnt of some drugs which can decrease blood sugar level. Can you tell me some drugs which will increase blood sugar?
Bridge questions' (i.e. questions which bridge the gap between knowledge and its application)	How can the clinical differences in diarrhea originating from small intestine and large intestine help you to decide on the need for antibiotics in a child with diarrhea?

Facilitating good online discussions

Online discussions have high pedagogical value as they promote interactivity, engage students and build in social presence. Gao et al[32] have suggested that online discussions should aim at promoting higher order thinking. This can be done by questioning, elaborating, interpreting and relating information to prior knowledge. Discussions should help students to construct their own knowledge. Presenting and discussing conflicting perspectives (e.g. role of statins in cutting down risk of myocardial infarction, differing views on ethics) helps in generation of knowledge which is long lasting.

At first, it may appear difficult but most of the nuances of good face-to-face discussions can be applied online as well. Some of the techniques of good facilitation are as follows:[33]

a. Involving all students in discussions is important. If the groups are very large, it makes sense to divide them into manageable sub-groups with facilitators in each group. In case enough faculty are not available, residents can be trained in facilitation skills.
b. Teachers should make an effort to identify non-responders and encourage them to contribute. Similarly, one should not allow a few students to dominate the discussion.
c. All contributions must be acknowledged. This opportunity should be utilized to provide feedback to students.
d. A good facilitator knows when to speak and when to go silent. While the facilitator may have to take the lead in the beginning, a good discussion means that students interact with each other with the facilitator taking a back seat.
e. Students tend to be callous and abrasive with each other in online settings. This might lead to friction and others might not participate enthusiastically. Therefore, it is important to set ground rules in the beginning and intervene when any untoward incident occurs
f. Allow students to lead the discussion after they get used to the format. This helps them to develop ownership of the process and brings out new ideas, new way of looking at existing situations, and a much-needed change from monotony.

Online classroom management

One of the key differences between conventional and online classes is classroom management. In a conventional classroom, the teacher can ‘see’ all students, notice their body language, ask/answer questions from specific students and move around in the class. In online classes, however, this functionality is limited. Several software packages allow conversion of a large class into smaller groups (breakaway groups). But the best

method is to manage the group as a whole. Just like conventional classes, it may be good idea to keep the class size small. Students generally remain ‘anonymous’, especially when the online class size is large. This usually helps otherwise shy students to ask doubts using the chat box function.

Another important difference lies in the learning environment. While mobile devices are generally discouraged in conventional classes, they play an important role in online classes. As both teachers and students are getting used to the new behavioural norms, it may take some time to adjust when f2f classes start again.

A concern voiced by many teachers is the ‘disappearance’ of students after logging in. While asking all students to keep “*camera on-mike muted*” might be one option, online assessment provides an important tool to ensure presence. The online teacher lacks the opportunity to see the expressions of her students to gauge their understanding. This is where role of ongoing assessment comes in. This will be discussed more under the assessment section.

Table 13 lists some online classroom management techniques:

Table 13: Online classroom management techniques

1. Lay down ground rules for the classroom
2. Encourage students to develop their own ground rules
3. Emphasize interaction. Try to identify non-responders
4. Use breakaway groups to encourage interaction
5. Be a roving facilitator when using breakaway groups
6. Avoid information overload
7. Pose probing and application-oriented questions
8. Provide immediate feedback
9. Use techniques like flipped classroom to promote active learning
10. Don’t read from your slides
11. Link attendance to participation in class
12. Use more than one technology to promote interaction.

B. POST-SESSION ASSESSMENT AND EVALUATION

Wherever possible, plan to conduct online summative assessment after an online teaching session. It does not stand to reason that the learners trained through one type of learning environment are assessed through a different one. Where online assessment is not possible, traditional methods of assessment can be used.

Some simple informal classroom assessment techniques such as polls, muddiest point or one-minute paper can help in knowing whether the concepts just taught have been understood by students or not. For formal assessment, MCQ tests can be carried out using Google Forms or other interactive tools.

Evaluation must be carried out as part of quality assurance practices. Evaluation of both the learning process and outcomes must form a part of any online teaching program. Student feedback can help in improving the manner of delivery of this content. More on this topic can be read in the section on Quality Assurance of online learning.

Teaching Procedural Skills Online

Teaching procedural skills online is a formidable challenge to medical educators. E-learning has been shown to be effective in supporting skills teaching. Fitts and Posner's[34] three-stage theory of motor skill acquisition is a popular method used in teaching surgical and motor skills. These three stages of acquisition of a skill are:

(a) **Cognition** or understanding the task: This needs explanations about the activity.

(b) **Integration** or comprehension and performing the mechanics of the task: This needs provision of feedback and deliberate practice.

(c) **Automation** or ability to perform a task with efficiency, speed and precision: This needs little cognitive input but automated performance. The focus is on refining performance.[35]

While the stage of cognition can be fostered by online interactive sessions, the stages of integration and automation require specific planning. Complex procedural skills can be taught by breaking them down into small steps. Peyton[36] suggested a four-step approach to introduce skills to new trainees as follows:

Step 1: Demonstrate: The instructor shows the skill at a normal pace. No additional comments are offered at this step.

Step 2: Talk the trainee through: The instructor describes each sub-step of the procedure while showing the skill again to the students.

Step 3: Trainee talks trainer through: Here the trainee describes the steps while the instructor performs the skill for the third time, based on the trainee's description.

Step 4: Trainee does: The trainee performs the skill on his or her own.

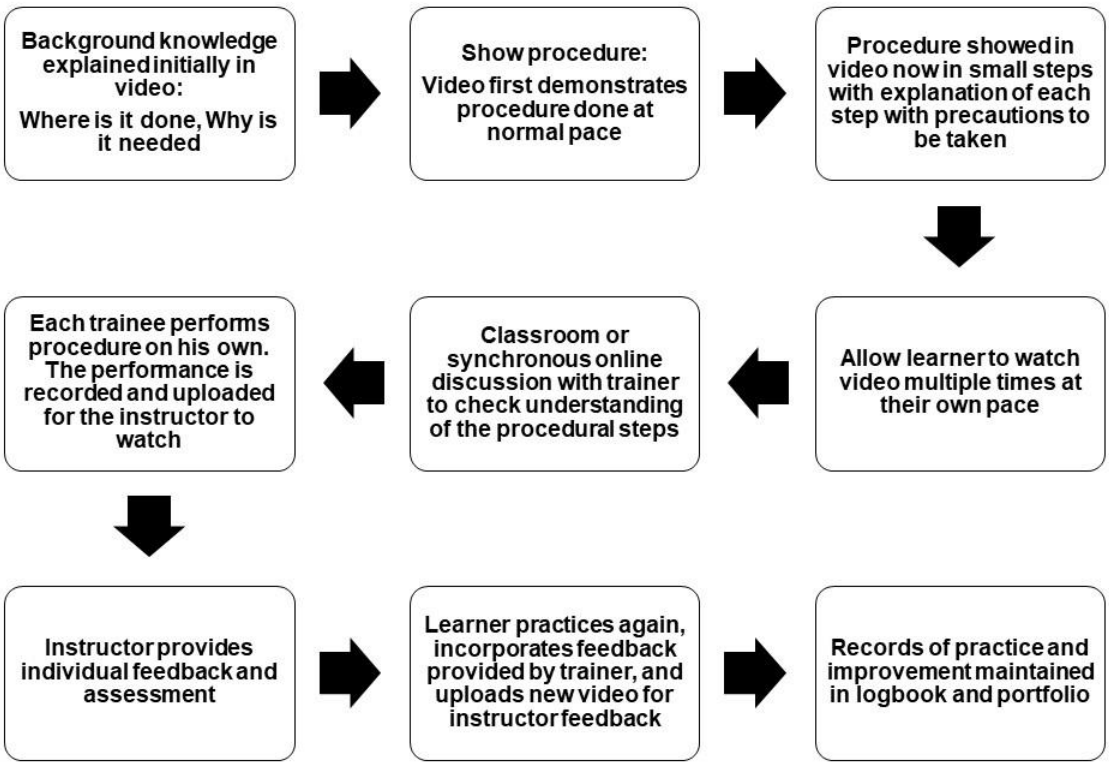
These steps break the task into four components: demonstration, deconstruction, formulation and performance.

Online instructional videos provide learners an opportunity to watch the demonstration and to deconstruct different steps of the skill at the trainee's pace. These videos have the flexibility of being paused and being watched repeatedly at multiple occasions. This is said to help learners understand complex procedures better. This process helps in acquisition and retention of the procedural knowledge.[37] Further, if used in a blended manner, this can be combined with actual performance. The performance phase can be recorded and can be used to provide formative feedback. These videos can be used for

supervision, post-procedure debriefing, providing feedback, assessment and promoting reflection.[37]

Alternatively, these videos can be watched in small groups / online break rooms with discussion.

Fig.3: Suggested training model of how online videos can be used to teach skills



For example, a simple procedural skill such as tying a knot, or suturing needs task-training models. An instructional video can take the trainee through the steps of demonstration and deconstruction. The comprehension step (“trainee talks the trainer through”) can be done by using synchronous interactive online sessions with the trainer. The next step of performance (“trainee does”) can be recorded. Simple recording devices such as a laptop, smart phone or headgear camera can be used for supervision and recording. The recorded video can be uploaded to obtain feedback and for assessment. The learner can repeat the performance based on the received feedback, and again upload a new video

until he attains the pre-defined level of competence. Feedback provided on these videos have been shown to improve simulation scores, technical skills and even patient safety.[38]

Availability of task training models or kits for all the procedural skills could be a challenge. The learning resource material needs to be developed or acquired depending on the availability, resources and requirements. If common training kits can be made available for all the learners by the institution, it ensures uniformity. For more complex procedural skills, availability of mannequins and online screen-based virtual-reality simulators will be valuable for training, feedback and assessment.

It is possible to prepare peer-reviewed educational videos to teach skills and procedures.[39] People learn effectively from multimedia.[40] Learners have been found to use online videos prepared for conducting OSCEs for self-study of clinical skills.[41]

Teaching health humanities online

Competencies that focus on imbibing appropriate values, ethical conduct, professionalism, interpersonal and communication skills are an important component of the MBBS program. These skills were previously deemed to be obtained passively by observing and associating with senior colleagues in the profession. However now, with the introduction of modules like AETCOM[42], the acquisition of these competencies has been mainstreamed. Many of these outcomes lend themselves to online acquisition with correct lesson planning and appropriate use of technology.

It must be remembered that learning needs should drive the use of any technology and not vice versa. Many of the learning outcomes can be attained by fairly low investment in technology and use of free and open-access resources. We have chosen examples from the AETCOM module[42] to demonstrate how the online learning environment may be used and adapted to help learners acquire requisite competencies.

Example 1. This example uses a first-year communication module that encompasses large group and small group learning, observation skills, collaborative and self-directed learning and formative assessment. This example uses Module 1.4 of the AETCOM booklet[42].

S. No.	Component	Online adaptation	Resources
1.1	Introductory session	Online lecture to large group OR Uploaded recorded lecture with online discussion (flipped classroom format)	Online video platform (subscription or open source) Above + Online repository such as YouTube
1.2	Self-directed learning	Provide assignments that require students to: - research and compile information individually and in groups - prepare and upload reports These reports are then reviewed by faculty and shared with students	Group email OR Online word processing platforms that allow documents to be shared or edited together ± Online video platform that allows group calls
1.3	Small group sessions on improving communication skills	A communication video with common mistakes in communication is prepared with standardized patients This is viewed together by learners A discussion (live or chat box), that elicits student observations of these mistakes and how to correct them, follows	Online video platform (subscription or open source)
1.4	Closure session	A discussion in small groups that summarizes learning and future learning to be done	Online video platform
1.5	Assessment	Students are graded for - Participation in activity and - assessment of self-directed learning	Spreadsheet or an electronic form with components

Example 2. The second example adds the complexity of a skill session. This example uses Module 3.1 of the AETCOM booklet[42].

S.No.	Component	Online adaptation	Resources
2.1	Introductory session	Same as in example 1.1	Same as in example 1
2.2	Small group sessions	Same as in example 1.3	
2.3	Skills lab sessions	A standardized patient is available online for real-time communication. A communication task is provided to the student which is done online. (Ideally the session is recorded and uploaded to the server for retrieval by the student designated peer and preceptor) The standardized patient assesses learners using a check list and comment form and submits it online. He can also be available for the debrief. After the task is completed, the student retrieves the recording of the encounter and records observation, comments and points for improvement The preceptor can view the interaction live OR can retrieve the recorded encounter and review. A debrief opportunity is created between the student and the preceptor where the performance is reviewed and a plan for improvement is made through guided reflection.	Online video platform (subscription or open source) with recording facility (ideal) and ability to retrieve and view (ideal) Online form to collect patient-preceptor and learner impressions of encounter

Example 3: This example describes a way to emulate a team tag-along session. This example uses Module 2.4 of the AETCOM booklet[42].

S.No.	Component	Online adaptation	Resources
3.1	Tag-along session	An identified member of the health care team joins on a video call with the group of students and facilitator. After an initial goal-setting discussion, the member of the health care team does a walkthrough of his or her area talking and taking questions from the students. A front facing camera fixed to the upper garment and earphones are simple and cost-effective workarounds (as opposed to having another person accompanying the team member with a camera). It is important to brief patients and colleagues involved in this session and get necessary permissions for use of videos and images.	Online video platform (subscription or open source) Smart phone to transmit the walk - through to the online platform
3.2	Small group discussion	Can be done immediately following the walk through or later to elicit observations, reflections, summaries and learning	Online video platform (subscription or open source)

Example 4: This example provides a way to emulate a session on empathy. This example uses Module 2.8 of the AETCOM booklet[42].

S.No.	Component	Online Adaptation	Resources
4.1	Patient interviews	With suitable and appropriate permissions students may be allowed to interview family members of patients through an online platform. (If needed, faculty observer can be present to ensure comfort and safety). Logins from different locations of family members allows exploration of feelings of relatives - not proximate to the patient.	Online video platform (subscription or open source)
4.2	Large group discussion	After suitable permissions have been taken, family members are asked to join, speak and answer questions from participants in a large group discussion on a moderated online platform.	Online video platform (subscription or open source)
4.3	Self-directed learning	Lists of online resources such as videos or movies are provided. Students can view them offline - write a report and submit them.	Ability to submit through email or an online submission process
4.4	Closure	Same as in 1.4	
4.5	Formative assessment	Submission of items in 4.3	

Example 5: This example provides an example for emulating an online-case based discussion on medical ethics. This example uses Module 3.2 of the AETCOM booklet[42].

S.No.	Component	Online Adaptation	Resources
5.1	Introduction of the case	A paper case may be posted ahead of time and introduced through a small group online session. Innovation could include a video recording of a patient interview followed by discussion.	Online video platform (subscription or open source)
5.2	Self-directed learning	Same as in 1.2 based on the case provided	
5.3	Anchoring lecture	Same as in 1.1	
5.4	Discussion and closure of case	Same as in 1.4 Additionally, an online role play can be done with two students. Remaining students can identify issues and critique them.	Online video platform (subscription or open source)

From these examples, it may be evident that a good approximation of learning which occurs in a physical environment, can be emulated in an online environment. This requires adequate planning and use of resources even if limited creatively. It must be emphasized that, remote learning is not a substitute to proximal guided learning that a master teacher provides. The use of webcams and phone cams reduce the amount of detail that can be captured in an online system and do not completely replace the aesthetics and immersive experience of a skills lab or patient care setting. However, planning, practice and wise use of technology allows skill acquisition to proceed in an uninterrupted fashion.

Online assessment

Online assessment involves the use of electronic or digital devices to construct or deliver assessment tasks. This may also be used to monitor progress of learners, to mark or grade assessments, and for record keeping of these data. The digital devices can range from simple devices such as smart phones or tablets, to laptops and desktop computers, and can go up to complex simulators and gaming devices.

Role of assessment in online teaching

Assessment can be used in different ways in online teaching. Some of them are as follows:

1. ***Assessment before teaching***: Using short quizzes or tests before starting a topic can be useful for teachers to gauge the baseline knowledge and skills of the students. This can be used to subsequently tailor the teaching according to the level of the learners. This can even be done informally by asking questions before the session starts using the poll option or chat box. Teachers need to know the level of the group as a whole and not individual performance in this situation.

2. ***Assessment during teaching***: This can be done at the level of a course or at the level of a teaching session.

    a. Tests conducted midway between a course help students to self-assess their learning and keep up with the deadlines. They help teachers to make mid-course corrections and give feedback to learners.

    b. It is always a good idea to break up long teaching sessions into smaller sections. This helps students to concentrate. Several simple classroom assessment techniques[42] exist and these are useful as these are quick, anonymous, and non-graded. Techniques such as polls, muddiest point or one-minute paper can help in assessing knowledge, recall, and understanding. Several of these techniques can be adapted to online settings with use of interactive applications. Here key messages from the topic just taught can be asked in an applied form. This helps teachers in knowing whether the concepts just taught have been assimilated by students or not. Again, here group performance will be important rather than individual performance. If most of the students have got the answers wrong, the concept will have to be revisited and explained. Concept maps and one sentence papers can be used to test ability to synthesize knowledge.

Breaks such as these, also give students a chance to ask for clarifications, which they otherwise hesitate to ask.

3. ***Assessment after teaching***: This can be done at the level of a unit or at the level of a course:

    a. After completion of a unit (or some units), formative assessment can be done. Here the purpose will be to assess the performance of the learners, as well as to give feedback about what they have done well and what can be improved.
    b. After the completion of a course, summative assessment is performed to make pass/fail decisions for certification.

4. ***Assessment as learning***: It is customary to classify assessment as formative (assessment *for* learning) and summative (assessment *of* learning). The contemporary trend is to use assessment to facilitate learning. This involves giving students an assessment task which will require them to go through an authentic experience or perform an activity, and thereafter submit a report. For example, students could be asked to go into the community or a hospital ward, interact with certain subjects, read about the topic, and compile their findings and submit their learning in the form of a report. This kind of assessment erases the artificial divide between learning and assessment. This also promotes self-directed learning.

Formats for e-assessment

When online assessments first started, they merely involved transfer of paper-based questions to an online format. However, much of that has now changed. With e-assessment, a whole range of different question formats are possible.

These include multiple choice questions and their variations such as extended matching or assertion-reason type questions. But besides these, there is the possibility of using audiovisual triggers such as clinical photographs, X-rays, gross or microscopic images, graphs, or auscultation sounds. Simulations can be used to develop electronic patient management problems and virtual patient scenarios.

Live interactivity is possible in online assessment which makes it possible to perform virtual OSCE, where students can be assessed using standardized patients or videos. This is useful for assessment of communication skills and history taking skills.

Electronic portfolios can be used to gather evidence of learning. Activity based assessment such as project-based assessment or reflective writing are useful methods

which can assess behavioural competencies which are usually considered ‘immeasurable’.

The different question formats that can be used in online assessment are summarized in Table 14.[44-45]

Table 14: Different question formats that can be used in online assessment

- Multiple choice questions and its variants
- Short answer questions
- Online polls
- Picture based questions based on audiovisual clues
- Electronic Patient Management Problems
- Objective structured video examination (OSVE)
- Projects
- Reflections
- Portfolios

Advantages of automation

Use of well-designed online assessment formats brings in efficiency and ease in marking assignments. Several assessment formats can be automated during their construction phase, reducing subsequent faculty workload. Use of well-constructed rubrics and standard marking formats can make most assessment formats more reliable and fair to learners, by reducing inter-rater variability. It is possible to verify whether students are adhering to deadlines and submitting assessments on time. Monitoring learner progress is simplified as record keeping is much more meticulous and at one’s fingertips.

Rethinking the concept of what to ask

Since online assessment first began by replicating paper-based assessment to computer-based settings, most people presume that it can be used only to test objective assessment questions. However, this is not true. The way students learn, depends heavily on what kind of mental processes are activated by the questions asked during assessment. If questions merely test rote learning, students will veer towards surface learning. When questions asked are more complex, students will start learning deeply and try to connect the dots between different mechanisms. The kind of trigger that we use to ask questions influences the learner’s way of studying differently. This can be done by the following ways (Table 15):

Table 15: How to ask questions differently

What to ask	How to do this and what this does	Example
Ask higher order questions	Rather than asking questions from the lower levels of Bloom's Taxonomy which encourage rote learning, ask questions from the higher levels such as comprehension, application, analysis, synthesis and evaluation. These could be in the form of problem-solving exercises, projects, surveys, or case studies.	Instead of asking: *Enumerate the morphological changes seen in the heart in rheumatic heart disease.* convert it into a higher-order question by simply using a clinical scenario. *If a child with rheumatic fever is not treated, what are the changes that can be expected to be seen in the heart 15 years later?*
Ask integrated questions	Ask questions based on pathophysiology and mechanisms in clinical subjects. Similarly, when teaching basic subjects, the applied relevance must be emphasized. This will help students to form neural connections in their mind and study a subject deeply by understanding the basics rather than merely memorizing it by rote.	Instead of asking: *'What is the action of cyclooxygenase on inflammation?'* the student can be given a scenario like, '*After watching too many webinars, a student has a headache and takes an aspirin to relieve the pain. Which steps of inflammation will be affected by the medication*?'

Build authenticity into questions	When students will finally encounter patients, they are likely to face complex situations. So instead of restricting questions to one chapter or topic, it may be useful to expose them to scenarios where they need to explore their learning beyond unit-wise or department-wise boundaries. Authentic scenarios will help in preparing students for real life patients.	If a question about a treatment of a condition is asked, it may be possible to include details about a co-morbid condition, which could lead to side effects or contradiction to use of a routine drug. If a patient is poor, and a drug cannot be afforded, then that kind of situation can be built into the question. If a patient might not be expected to comply with a regimen, then what choices would a physician have to alter his management?

Assessment in clinical settings

When it comes to assessing clinical competencies, cognitive parts of competencies such as clinical reasoning and communication skills can be assessed online. It is also possible to test heart sounds or visual signs through online platforms. Simple electronic patient management problems or complex AI technology-based virtual patients (computer-based simulations) can be used to test clinical reasoning skills.[46-48]

There have been reports where Objective Structured Video Examinations (OSVE) have been used with some evidence of being valid.[49] In an OSVE, different clinical scenarios were chosen depending upon the clinical and communication skill competencies to be tested. Short patient-clinician interactions, less than 10 minutes long, were scripted and filmed. Each scenario included some deliberate communication skills elements such as greeting the patient, checking for the identity, use of open and closed questions, eye contact, displaying empathy, clearing doubts, summarizing and closing. Some obvious errors in communication were included in the script. Students were expected to watch the video. Thereafter, they were given answer sheets where they had to identify what was done right and what was done badly in the patient-doctor interaction.

However, Holmboe[50] stated that “although simulated patients and other simulation technologies were important and reliable tools for teaching clinical skills and evaluating competence, they cannot substitute direct observation of students’ clinical skills on real patients by the faculty”.

Now, with the availability of software which permits real time interactivity such as Google Meet, Zoom or Skype, students can be observed and assessed on history taking or communication skills using real or standardized patients. These sessions can be recorded easily and assessed. Assessment of communication skills, professionalism and attitudes can be done through use of simulations, standardized patients and online *viva*. This has been discussed earlier. Use of hypothetical scenarios can help in assessing a student's competence in managing complex clinical situations.

With the availability of break-out rooms, several institutes are experimenting with conduct of online or electronic OSCEs. This, however, requires a great deal of coordination and planning so that students move in and out of online OSCE sessions seamlessly. Each room needs presence of cameras and recording equipment. Faculty and standardized patients are needed depending on the stations. Proctoring devices and encryption of data may be essential. This is an expensive affair, and needs involvement of a whole team of faculty, assistants and IT specialists to run smoothly.

Choosing the right assessment tools

The assessment clock model[51] provides educators practical guidance about how to determine the key characteristics of assessment and decide the most suitable assessment tool in a normal or crisis situation. This model is based on van der Vleuten's[52] empirical formula:

> *Utility of assessment = Validity x Reliability x Cost-effectiveness x Acceptability x Educational Impact*

The model can be interpreted to suggest that in normal circumstances, when one is developing a low-stakes examination, more weightage should be given to features like the cost, acceptability and educational impact. For high stakes examinations, validity and reliability are more important characteristics. However, in crisis situations like the Covid-19 pandemic, weightage would be on acceptability and cost issues, especially as we are transitioning to a new method of assessment, and there are issues of fairness and security.[53] Validity and reliability will remain the most important issues for high-stakes examinations like selection examinations and high-quality items must be chosen carefully for inclusion into question banks.

Feedback in online settings

Feedback is a two-way process. Students need to get feedback on how they are performing, while teachers need feedback from students on how their teaching is being received.

When learners are provided with formative feedback, assessment becomes a learning opportunity. Online assessment enables provision of individualized feedback which plays a very important role in enhancing student learning. This can be done using several formats. In case of assessment-related feedback, examples and model answers provide excellent opportunity for the student to compare his performance. This can help one to reflect on the assessment process also.[54] Feedback can be built into assessment, using automation in certain cases. For example, in case of self-assessment modules to be administered at the end of every unit, specific feedback can be built into each option chosen by the learner. Automation easily enables this to be shown to the learner as soon as they have submitted their responses. Another way of providing feedback is to design automated feedback statements based on scores obtained by the learner. This might not be very specific but can provide some guidance to the learner. For faculty, common feedback responses can be designed in the form of macros which need to be inserted by ticking a box, enabling faster marking and provision of specific individualized feedback.

Feedback related to psychomotor skills can be given after viewing recorded videos as explained earlier. The logbook can also be maintained electronically with options for locking after each loop. This can also serve as a permanent record of the progress made by the learner.

If time permits some personal time devoted to each student can be very productive. However, personalized feedback requires lot of time and effort from teachers. To be available to students for voice interactions outside the scheduled sessions can be very helpful, but taxing for the teachers. It may be a good idea to provide fixed time slots for personalized interactions through virtual or telephonic modes.

Group feedback is another technique, where all assignments and feedback are available for all members to view and correct themselves. This also makes the whole process transparent.

One advantage of using online tools is that feedback can be given in the form of small doses which are spaced out throughout the course. Small doses of frequent formative feedback will be more easily accepted and assimilated by learners. Faculty will need to be trained in providing constructive feedback. Use of rubrics and macros can enable specific feedback to be delivered efficiently and at fixed periods, depending on the pace at which learners are progressing.

The issue of plagiarism

A common complaint among teachers is that students tend to copy and paste from online sources. Plagiarism is a universal phenomenon among learners. It will be important to spread awareness about what constitutes plagiarism and why it should not be practiced

among both students and faculty. Use of anti-plagiarism software should become a routine practice. A strict non-tolerance policy against plagiarism needs to be enforced and a culture of academic integrity needs to be slowly encouraged on all campuses.

The cost of online assessment

While there are several free or low-cost software and applications which permit one to conduct low-stakes examinations and classroom assessment easily, using online tools for high-stakes examinations comes at a high cost. However, as the number of users increase, the cost of these software applications is likely to come down.

Proctoring devices are required to eliminate the possibility of student cheating and manipulation. These need to be installed at the level of the Universities and institutions, to prevent copying. Electronic software is available which block the use of other screens when the examination is on. There are ways to monitor eye movement and time away from the camera. These tools can enable examinations to be carried out under surveillance of web cameras. This will incur massive costs and will require storage of huge amounts of electronic data.

It must be remembered that online assessment is not the ultimate solution to all our woes. It must be used in conjunction with face-to-face assessment. However, it does help in reducing faculty workload through automation. To be fully acceptable, we will have to seek tools which make assessment valid, reliable, cost-effective and acceptable.[55] Overall, one cannot ignore the educational impact of using assessment on student learning. Online assessment is now an integral part of the assessment toolbox. It is not a substitute, but a complement to regular face to face assessment.

Quality assurance in online learning

As the use on online modes of teaching and learning increases, it becomes important to monitor the quality of educational processes and determine if the intended educational outcomes have been attained.

Several processes need to be evaluated for quality assurance in online learning.[56-57] These are listed below:

(a) Leadership and management: Policy, vision, mission, goals, planning
(b) Faculty profile and faculty development
(c) Availability of technology, infrastructure and learning resources
(d) Curriculum design
    i. Competencies, learning outcomes and learning objectives
    ii. Instructional methods
    iii. Course activities and learner engagement
    iv. Assessment
    v. Continuous quality improvement and evaluation
(e) Learner support and feedback: learner profile
(f) Learner accessibility and experience

Just as in the traditional classroom, some **benchmarks** are essential to the conduct of online teaching. These include[58]:

- clear planning,
- good infrastructure,
- faculty support to conduct online learning,
- clear standards for good course design,
- clear instructions for students,
- open communication channels between faculty and students,
- regular feedback to students on their progress,
- regular feedback from students on their experience, and
- continuous monitoring and evaluation.

How to conduct blended learning sessions

It is predicted that online learning will continue to be a part of our regular teaching armamentarium even when the pandemic ends, albeit in a blended learning format. **Blended learning is the "thoughtful integration of classroom face-to-face learning experiences with online learning experiences**".[59] Given the experience of online learning that has been gained during the pandemic, it may be useful to continue using it in the post-pandemic phase, in a blended learning format, subject to further deliberations and consensus.

Blending the advantages of face-to-face interactions with online sessions enhances the learning process. Blended learning can:[60]

- Expand the opportunities available for learning,
- Provide information and resources for learners,
- Streamline course management activities,
- Facilitate student engagement through interactivity and group work.

Hallmarks of blended learning:

There are four hallmarks of blended learning (Fig.4). These are:

1. **Seamless integration of online and face-to-face session:**
   The facilitator integrates the face-to-face session with online activities by summarizing the online activity and linking it with the face-to-face session.

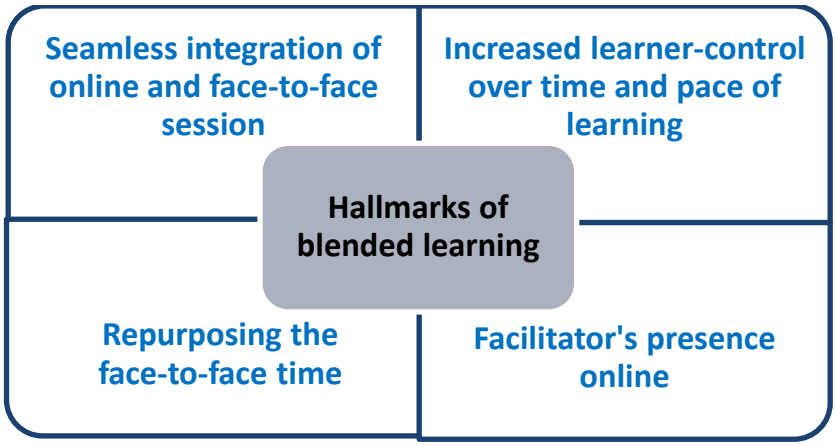
2. **Increased learner control over time and pace of learning:**
   Learners should be able to access the online contents at the time and place of their convenience. There should be flexibility in learning.

3. **Online presence of facilitators:**
   Facilitators should be visible through the online activities. This is possible by providing timely feedback and participation in discussions.

4. **Repurposing the face-to-face time:**
   Traditional class time is replaced with time taken by students to carry out their online learning activities. It is ideal to use the face-to-face learning time to impart higher-order learning and skills, while using the online sessions to recall or deliver basic knowledge and carry out collaborative activities. Blended learning provides

possibilities to repurpose the contact time to facilitate deeper thinking and in-depth learning.

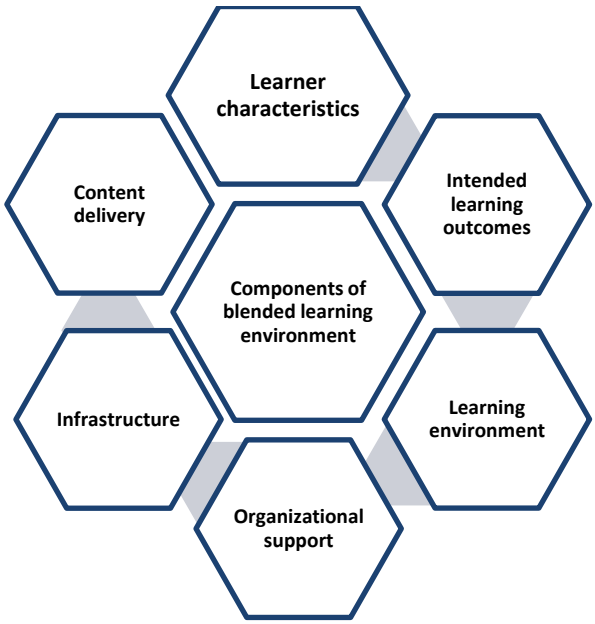
Fig. 4: Hallmarks of blended learning



Components of blended learning

Fig. 5 shows the main components which make up the blended learning environment.

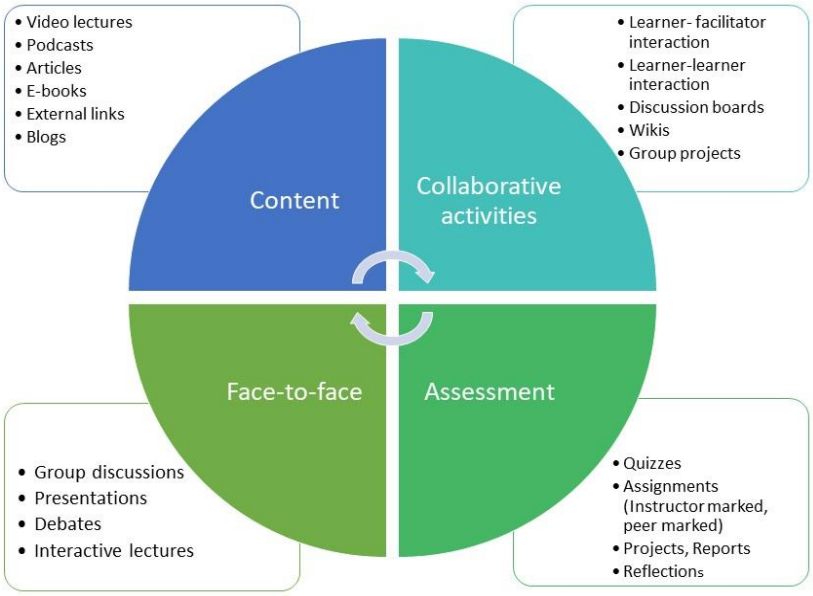
Fig. 5: Main components of the blended learning environment



Designing a blended learning session

The process of blended learning goes through the following steps in a cyclical manner: planning, designing, implementing, reviewing and improving. Fig. 6 shows some of the activities that can be incorporated into blended learning sessions:

Fig. 6: Examples of activities which can be included in blended learning



Questions to be asked while designing online activities

1. How will the learning activity support the intended learning outcomes?
2. What will motivate the learners to engage in online activities?
3. How can the facilitator motivate the learners and encourage to support one another in online learning?
4. Can a learner's activities and tasks be incorporated into continuous assessment, so that the learning activities can conform to the principles of student-centred learning?

EXAMPLE

Here is an example of a blended learning module for undergraduate students of final MBBS (Part II):

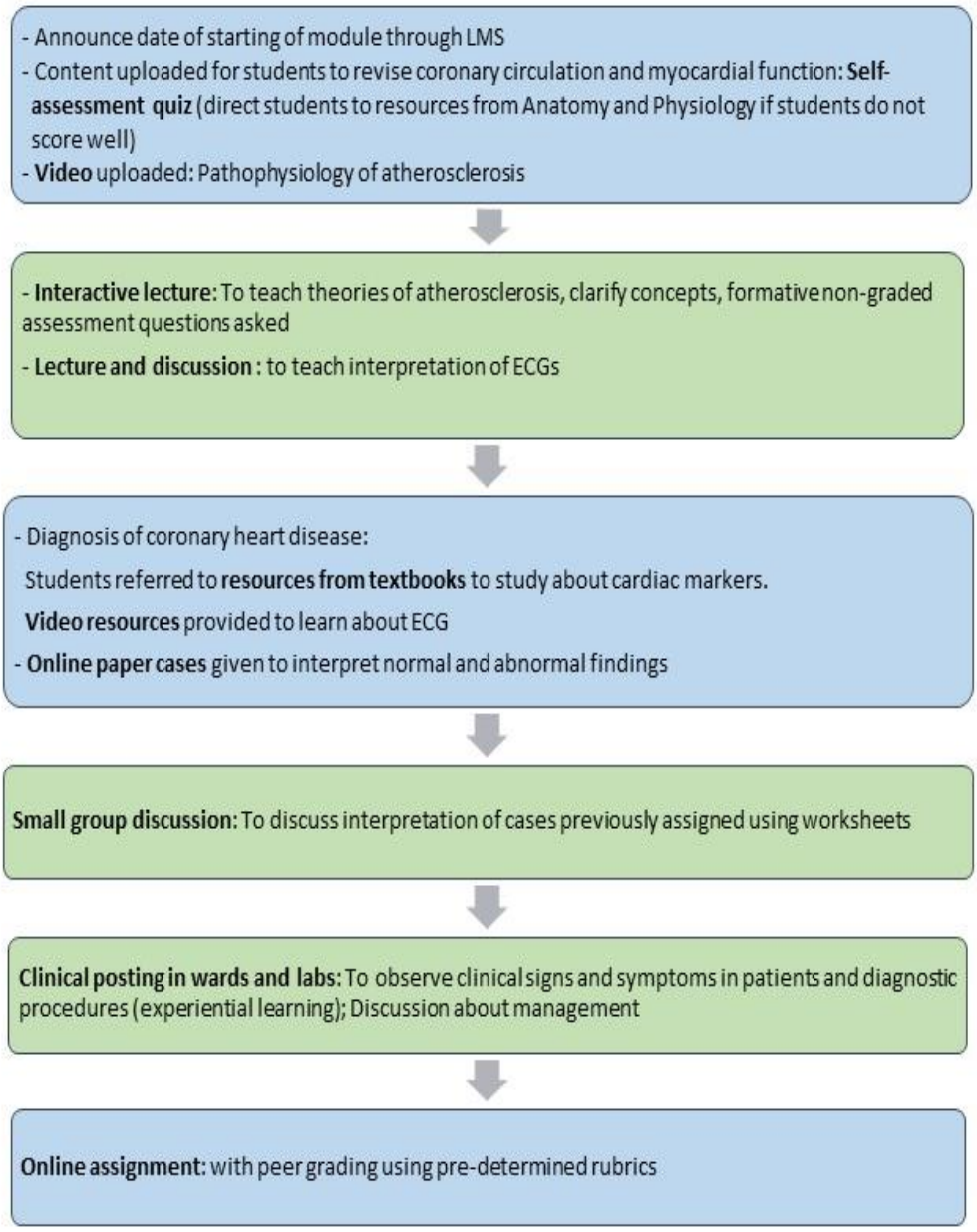
BLENDED LEARNING MODULE ON CORONARY ARTERY DISEASE

Learning objectives:
On the completion of this module, the learner should be able to:

- Describe the etiopathogenesis of coronary artery disease
- Choose the correct approach to diagnose coronary artery disease
- Apply the right medical and surgical approaches to manage a case of coronary artery disease

Fig. 6: Online and face-to-face components of a blended learning module on coronary artery disease

- Face-to-face - Online component



Advantages of Blended Learning

1. Improved content access to the learners,
2. Learner-centered teaching,
3. Improves communication, creativity, collaboration and critical thinking among learners,
4. Inculcate life-long learning skills,
5. Provides greater flexibility to the learners.

Challenges:

1. Creating infrastructure to deliver online contents,
2. Training faculty members in the process,
3. Providing accessibility to the learners,
4. Organizational culture and support.

Blended learning is an effective method which is student centric and provides flexibility to learners. It must be adapted to meet the needs of the new digitally savvy learners.

EPILOGUE

The concept of triage

During the Covid- 19 pandemic, most faculty have been involved in clinical care, and learners had to be off campus due to safety concerns. Medical education had to take a back seat. Clinical teaching, specially, has been disrupted in these unprecedented circumstances. At a time like this, we will have to take some difficult decisions to cater to our immediate needs and mitigate the long-term negative consequences. We will have to evaluate the feasibility of what can be done and triage our resources. At all levels, we will have to determine: (a) what activities can be continued, (b) what activities should be postponed, (c) what activities can be adapted to another format and what remedial action/s need to be taken, (d) what activities should be dropped, and (e) what new activities need to be added.[61] For example, if clinical teaching cannot be conducted during the pandemic, one has to assess which parts can be converted into video or online teaching, and what needs to be postponed for later. Batches of students who have missed certain competencies must be taught and assessed on those competencies, once the campus is safe for on-site classes. If Covid- 19 related competencies were not being taught earlier, they have to be added to the curriculum. This kind of mapping of competencies where sacrifices and difficult choices to be made are charted out, is useful in a crisis. These kinds of negotiations must be made reflecting on the ultimate impact on medical education in the future.

Sharing resources

Since most institutes face a resource crunch, it is advisable to share resources such as instructional videos and skills laboratories between institutes. Preparing instructional videos is time consuming and needs trained resource faculty. Once these instructional videos are prepared, they can be reused, and a library of such videos can be developed as collaborative project between the institutions or Universities for common use. Colleges of one region can collaborate and create electronic question banks using the concept of consortia. All participating institutes will need to contribute good quality questions which are validated to the question bank. Administrative costs of maintaining the question bank can be shared between all participating institutes.

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NATIONAL MEDICAL COMMISSION
Postgraduate Medical Education Board

D 11011/1/22/AC/Guidelines/15 **Date: 05-08-2022**

GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR M.D. IN PSYCHIATRY

GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR MD IN PSYCHIATRTY

Preamble

The purpose of PG education is to create specialists who would provide high quality health care and advance the cause of science through research & training.

A postgraduate specialist having undergone the required training should be able to recognize the health needs of the community, should be competent to handle medical problems effectively and should be aware of the recent advances pertaining to his specialty. The post graduate student should acquire the basic skills in teaching of medical/para-medical students. She/he is also expected to know the principles of research methodology and modes of consulting library.

The purpose of this document is to provide teachers and learners illustrative guidelines to achieve defined outcomes through learning and assessment. This document was prepared by various subject-content specialists. The Reconciliation Board of the Academic Committee has attempted to render uniformity without compromise to purpose and content of the document. Compromise in purity of syntax has been made in order to preserve the purpose and content. This has necessitated retention of "domains of learning" under the heading "competencies".

SUBJECT SPECIFIC LEARNING OBJECTIVES

The primary **goal** of the MD course in Psychiatry is to produce a post graduate clinician able to provide health care in the field of Psychiatry. A physician qualified in Psychiatry, at the end of the course, should be able to diagnose and treat psychiatric disorders, take preventive and curative steps for the disease in the community at all levels of health care and qualify as a consultant and teacher in the subject.

At the end of the MD course in Psychiatry, the student should be able to:

- Understand the relevance of mental health in relation to the health needs of the country,
- Ethical considerations in the teaching and practice of Psychiatry,
- Identify the social, economic, biological and emotional determinants of mental health,
- Identify the environmental causes as determinants of mental health,
- institute appropriate diagnostic, therapeutic and rehabilitative procedures to the mentally ill patient,

- Take detailed history, conduct appropriate ethically valid physical examination and institute appropriate evaluation procedures to make a correct clinical diagnosis,
- Perform relevant investigative and therapeutic procedures for the psychiatric patient,
- Recommend appropriate laboratory and imaging examinations and interpret the results correctly,
- Plan and deliver comprehensive treatment of a psychiatric patient using principles of rational drug therapy,
- Plan rehabilitation of psychiatric patient suffering from chronic illness,
- Clinically manage psychiatric emergencies efficiently,
- Demonstrate empathy and humane approach towards patients and their families and respect their sensibilities,
- Demonstrate communication skills of a high order in explaining management and prognosis, providing counselling and giving health education messages to patients, families and communities,
- Develop appropriate skills to practice evidence-based psychiatry,
- Demonstrate competence in basic concepts of research methodology and epidemiology,
- Be aware of and take appropriate steps in the implementation of national mental health programs, effectively and responsibly,
- Be aware of the concept of essential drugs and rational use of drugs,
- Be aware of the legal issues in the practise of Psychiatry,
- Be aware of the special requirements in the practice of Child and adolescent Psychiatry and Geriatric Psychiatry.
- Be aware of the role of sex and gender in the practice of psychiatry
- Be able to determine the capacity and capability of the individual (especially children and adolescents) to identify and articulate a gender identity

- **Research:** The student should know the basic concepts of research methodology and plan a research project in accordance with ethical principles. S/he should also be able to interpret research findings and apply these in clinical practice. S/he should know how to access and utilize information resources and should have basic knowledge of statistics.
- **Teaching:** S/He should learn the basic methodology of teaching and develop competence in teaching medical/paramedical students, health professionals, members of allied disciplines (e.g. behavioural sciences), law enforcement agencies, families and consumers and members of the public.

SUBJECT SPECIFIC COMPETENCIES

By the end of the course, the student should have acquired knowledge (cognitive domain), professionalism (affective domain) and skills (psychomotor domain) as given below:

A. Cognitive domain

By the end of the course, the student should demonstrate knowledge in the following:

1. General topics:

1. The student should be able to demonstrate knowledge of basic sciences (Anatomy, Physiology, Biochemistry, Microbiology, Pathology and Pharmacology) as applied to Psychiatry.
2. The student should be able to explain aetiology, assessment, classification and management and prognosis of various psychiatric disorders (including psychiatric sub-specialities including Neuroanatomy, Neurophysiology, Neurochemistry, Neuroimaging, Electrophysiology, Psychoneuroendocrinology, Psychoneuroimmunology, Chronobiology and Neurogenetics.
3. Acquire knowledge of delirium, dementia, and amnestic and other cognitive disorders and mental disorders due to a general medical condition.
4. The student should be able to discuss long term care of persons with chronic mental health problems
5. The student should acquire knowledge of emergency measures in acute crisis arising out of various psychiatric illnesses including drug detoxification and withdrawal.
6. The student should acquire knowledge of pharmacokinetics & pharmacodynamics of drugs involved in psychiatric management of patients.
7. The student should acquire knowledge of (a) normal child development and adolescence (b) neurodevelopmental disorders, intellectual disability and specific learning disability and their management
8. The student should acquire knowledge and be able to explain mechanisms for rehabilitation of psychiatric patients.
9. The student should acquire knowledge of substance related disorders and their management.
10. The student should acquire knowledge of psychotic disorders, mood disorders, and anxiety disorders and their management
11. The student should understand difference between sex and gender/ biological and social construction of personhood; sexual/gender identity; transgender, gender non-conformity, and other gender diverse identities, sexual/sexuality identity, sexual orientation, sexual desire; the wide variety, and cultural presence of various sexual orientations and desires; gender dysphoria and its management.

12. The student should acquire knowledge of eating disorders and sleep disorders and their management
13. The student should be conversant with recent advances in Psychiatry.
14. The student should be conversant with routine bedside diagnostic and therapeutic procedures and acquire knowledge of latest diagnostics and therapeutics procedures available.
15. The student should be conversant with various policy related aspects of Psychiatric practice in India (e.g. Mental Health Act, National Health Mental Health Programmes etc.).
16. The student should be conversant with research methodologies.
17. Student should be conversant with the role of Yoga and Meditation in the management of psychiatric disorders.

B. Affective Domain:

1. The student should be able to function as a part of a multidisciplinary team, develop an attitude of cooperation with colleagues, and interact with the patient and the clinician or other colleagues to provide the best possible diagnosis or opinion.
2. The student should always adopt ethical principles and maintain proper etiquette in dealings with patients, relatives and other health personnel and to respect the rights of the patient including the right to information, confidentiality and second opinion.
3. The student should develop communication skills to prepare reports and professional opinion as well as to interact with patients, relatives, peers and paramedical staff, and for effective teaching.

C. Psychomotor domain

At the end of the course, the student should acquire the following clinical skills and be able to:

1. Obtain a proper relevant history and perform thorough clinical examination including detailed mental state examinations using proper communication skills.
2. Able to do risk assessment and mental capacity assessment.
2. Provide a clinical formulation, arrive at a logical working diagnosis and differential diagnosis after clinical examination.
3. Order appropriate investigations keeping in mind their relevance and cost effectiveness and obtain additional relevant information from family members to help in diagnosis and management.

4. Identify psychiatric situations calling for urgent or early intervention and refer at the optimum time to appropriate centres.
5. Write a complete case record with all necessary details.
6. Write a proper discharge summary with all relevant information.
7. Obtain informed consent for any examination/procedure.
8. Perform clinical audit.
9. Must be able to perform modified Electroconvulsive therapy (ECT).
10. Should have the following skills in relation to gender related issues:
    - Demonstrate the ability to assess the gender identity of an individual and distress caused (if any) due to the individual's own gender identity in simulated environment.
    - Describe and understand how to discuss sexual orientation, sexuality identity, gender identity, as well as intersex identity (differences in sex development) as part of routine history taking.
    - Demonstrate the ability to educate and counsel individuals or family members about intersex variations, sexual orientations, sexuality identities, gender incongruence, gender dysphoria, and gender identities. Demonstrate ability to identify when a mental health referral is needed for the above.
    - Demonstrate knowledge that conversion therapy practices for sexual orientation or gender identity or on people with intersex variations is unethical.
    - Describe differences between Gender Incongruence and Gender Dysphoria.
    - Describe and understand gender identity, the biological and gender binaries, rejection of gender binary, gender non-conforming, gender non-binary, androgynous, and other identities.
    - Demonstrate the ability to educate an individual and family members that Gender Incongruence by itself is not a disorder and does not require clinical intervention. Any form of conversion therapy is unethical.
    - Discuss situations where there is a role for mental health support in Gender Dysphoria i.e., discussing with family, deciding on hormonal treatments or Sex Reassignment Surgery (Gender Affirming Care or Gender Affirmative Therapies or Gender Confirmation Surgery).

The student, at the end of the course should be able to perform independently, the following:

1. Conduct detailed Mental Status Examination (MSE)
2. Cognitive behaviour therapy
3. Supportive psychotherapy
4. Modified ECT and non-invasive neuromodulation
5. Clinical IQ assessment
6. Management of alcohol withdrawal
7. Alcohol intoxication management
8. Opioid withdrawal management
9. Delirious patients
10. Crisis intervention

The student must be able to assess a patient with following symptoms:

1. Psychotic symptoms
2. Seizures true and pseudo seizure
3. Anxiety symptoms
4. Affective symptoms
5. Cognitive symptoms
6. Catatonia
7. Delirium
8. Malingering
9. Behavioral symptoms of developmental disorders

The student, at the end of the course should be able to perform under supervision, the following:

1. Behaviour therapy
2. Family therapy
3. Interpersonal therapy
4. Cognitive behaviour therapy and other newer therapies
5. First level psychological intervention for sexual abuse, sexual assault and domestic violence
6. Genetic counselling

Syllabus

Course Contents:

No limit can be fixed and no fixed number of topics can be prescribed as course contents. The student is expected to know the subject in depth; however emphasis should be on the diseases/health problems most prevalent in that area. Knowledge of recent advances and basic sciences as applicable to his/her specialty should get high priority. Competence in managing behavioural problems commensurate with the specialty must be ensured.

The student must acquire knowledge in the following:

Theoretical concepts:

1. Neurophysiology and Neuro-chemistry
2. Functional and behavioural neuroanatomy
3. Genetics
4. Psychoneuroendocrinology
5. Psychoneuroimmunology
6. Electrophysiology and cognitive neuroscience
7. Neuro-imaging
8. Memory

9. Sleep and circadian rhythm

10. Learning – Theories

11. Theory of personality

12. Clinical Psychology including Psychometry and Psychodiagnostics

13. Transcultural Psychiatry

14. Research Methodology and Statistics

15. Psychodynamics

16. Psychiatric assessment (including History Taking, Neurological Examination, Mental Status Examination, Investigations, Use of rating scales, etc.).

17. Classification In Psychiatry

18. Organic Psychiatry (including Psychological Features and Clinical Assessment of Cerebrovascular Disorders, Delirium, Epilepsy, Head Injury, Headache, HIV – AIDS, Infections, etc.)

19. Movement Disorders (including Medication-Induced Movement Disorders, etc)

20. Substance Related Disorders (including Alcohol-Related Disorders, Amphetamine-Related Disorders, Caffeine-Related Disorders, Cannabis-Related Disorders, Cocaine-Related Disorders, Hallucinogen-Related Disorders, Inhalant-Related Disorders, Nicotine-Related Disorders, Opioid-Related Disorders, Phencyclidine-Related Disorders, Sedative-, Hypnotic-, or Anxiolytic-Related Disorders, etc.)

21. Psychosis (including Schizophrenia, Schizophreniform Disorder, Schizoaffective Disorder, Delusional Disorder, Brief Psychotic Disorder, Shared Psychotic Disorder, etc).

22. Mood Disorders (including Depressive Disorders, Bipolar Disorders, Cyclothymic Disorder, etc.)

23. Anxiety Disorders (including Panic Disorder, Agoraphobia, Phobias, Obsessive-Compulsive Disorder, Generalized Anxiety Disorder, etc).

24. Stress and related disorders (Posttraumatic Stress Disorder, Acute Stress Disorder Adjustment Disorder etc.)

25. Somatoform Disorders (including Somatization Disorder, Undifferentiated Somatoform Disorder, Conversion Disorder, Pain Disorder, Hypochondriasis, Body Dysmorphic Disorder, etc.)

26. Factitious Disorders

27. Dissociative Disorders (including Dissociative Amnesia, Dissociative Fugue, Dissociative Identity Disorder, Depersonalization Disorder, etc.)

28. Personality disorders

29. Sexual disorders, gender dysphoria and psychological issues among LGBTQIA+ groups (including Sexual Desire Disorders, Sexual arousal

Disorders, Orgasmic Disorders, Sexual Pain Disorders, Vaginismus, Paraphilias, etc)

30. Eating Disorders (including Anorexia Nervosa, Bulimia Nervosa, etc.)

31. Sleep Disorders (including Insomnia, Narcolepsy, Breathing-Related Sleep Disorders, Circadian Rhythm Sleep Disorders, Parasomnias, Nightmare Disorder, Sleep Terror Disorder, Sleepwalking Disorder, etc.)

32. Impulse-Control Disorders (including Intermittent Explosive Disorder, Kleptomania, Pyromania, Pathological Gambling, Trichotillomania, etc

33. Psychosomatic Disorders including Consultation Liaison psychiatry

34. Miscellaneous: Non-compliance, Malingering, Antisocial Behaviour, Borderline Intellectual Functioning, Age-Related Cognitive Decline, Bereavement [including Death], Academic Problems, Occupational Problems, Identity Problems, Religious or Spiritual Problems, Acculturation Problems, Phase of Life Problems, Chronic Fatigue Syndrome, etc.)

35. Abuse (Physical / Sexual) or Neglect Of Child /Adult

36. Culture Bound Syndromes

37. Pre-Menstrual Dysphoric Disorder

38. Perinatal Psychiatry

39. Emergencies In Psychiatry including suicide, its management and medico-legal aspect

40. Psychotherapy

41. Psychopharmacology

42. Electro-Convulsive Therapy,Other brain stimulation methods (rTMS, DBS, tDCS and others) and Neurosurgery

43. Child and Adolescent Psychiatry (including Learning Disorders, Motor Skills Disorder, Communication Disorders, Pervasive Developmental Disorders (Autistic Disorder, Rett's Disorder, Childhood Disintegrative Disorder, Asperger's Disorder), Attention-Deficit/Hyperactivity Disorder, Conduct Disorder, Oppositional Defiant Disorder, Pica, Tic Disorders, Elimination Disorders, Separation Anxiety Disorder, Selective Mutism, Reactive Attachment Disorder of Infancy or Early Childhood, Stereotypic Movement Disorder, etc.)

44. Intellectual disability

45. Geriatric Psychiatry (including dementia, legal and ethical issues, positive psychiatry in aging, psychiatric aspects of long term care)

46. Community psychiatry

47. Rehabilitation of psychiatric patients

48. Ethics In Psychiatry

49. Forensic and Legal Psychiatry (including Mental Health Care Act, Persons with Disability Act, Narcotic Drugs and Psychotropic Substance Act etc.)

The student may know the following:

1. History of Psychiatry
2. Epidemiology
3. Mind – the evolving concepts
4. Psychiatry rating scales
5. Placebo Effect
6. Sex and Gender Issues in Psychiatry
7. Psychosurgery

TEACHING AND LEARNING METHODS

Teaching methodology

1. **Lectures:** Lectures are to be kept to a minimum. They may, however, be employed for teaching certain topics. Lectures may be didactic or integrated. Didactic lectures are of least importance; small group discussion such as seminars, journal clubs, symposia, reviews and guest lecturers should get priority for theoretical knowledge. Bedside teaching, grand rounds, structured interactive group discussions and clinical demonstrations should be the hallmark of clinical/practical learning. The student should have hands-on training in performing various procedures and ability to interpret various tests/investigations. Exposure to newer specialized diagnostic/therapeutic procedures concerning the subject should be given. Self learning tools like assignments and case base learning may be promoted.

   The post graduate student should have knowledge of:

   - Psycho-pharmacology and broadening the treatment options using medicines.
   - Neuro-imaging techniques to understand behaviour and psychiatric illness.
   - Community-Psychiatry.
   - Functioning of psychiatric hospital.

   Community Psychiatry should go beyond familiarization with the National Mental Health Programme. The post graduate student should have hands on experience with:

   - Training programmes for primary care physicians
   - Organizing Mental Health Camps

- Carrying out Health Education Activities
- Forensic /Legal Psychiatry
- Integration of Mental Health Care with General Health Care

2. **Thesis writing:** Thesis writing is compulsory.
3. **Research Methodology:** The student should know the basic concepts of research methodology and biostatistics, plan a research project, understand ethical issues of research especially in vulnerable groups such as those with mental illness and intellectual disability as well as minors, be able to retrieve information from the library, use reference managers .
4. **Teaching skills:** The post graduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.
5. **Continuing Medical Education Programmes (CME):** Each student should attend at least two CME programmes, in 3 years.
6. **Conferences:** The student should attend courses, conferences and seminars relevant to the specialty, and encouraged to make presentation in conferences
7. A post graduate student of a postgraduate degree course in broad specialties/super specialties would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.
8. **Seminars:** There should be a weekly seminar in which the PG students present material on assigned topics in rotation. It should be followed by discussion in which all trainees are supposed to participate. Generally, the topics covered should be those that supplement the formal teaching programme.
9. **Case Conference**: A case conference should be held every week where a PG student prepares and presents a case of academic interest by rotation and it is attended by all the members of the Department.
10. **Psychosomatic Rounds**: This is a presentation of a case of psychosomatic illness, or a medical illness with pronounced psychiatric problems. It should be held weekly in collaboration with various departments and attended by the faculty and the PG students of psychiatry and the concerned Department.
11. **Research Forum**: There should be a monthly meeting of one hour each in which the PG students present their plan of research as well as the report of the completed work of their projects. The other research scholars/staff in the department also may participate in it. The faculty, PG students and the non-medical professionals should make critical comments and suggestions.

12. **Journal Club**: A monthly meeting of Journal club should be held in which a senior PG student presents a critical evaluation of a research paper from a journal. All PG students are expected to attend.
13. **Case presentations**: All new in-patients and outpatients cases should be routinely reviewed with one of the Consultants. In addition, the PG student is required to present case material at routine rounds and other case conferences. Senior PG students will conduct evening classes on clinical topics.
14. **Extra-mural activities**: The post graduate students are encouraged to attend certain academic activities in allied subjects held outside parent department e.g. seminars/lectures held at Departments of Sociology, Psychology, Neurology etc.
15. **Psychotherapy tutorials**: These should be held in small groups supervised by a consultant, in which a case is presented by a PG student and psychotherapeutic management discussed.
16. **Rotation:**

Clinical Postings

- A major tenure of posting should be in General Psychiatry. It should include care of in-patients, out-patients, special clinics and maintenance of case records for both in and out patients.
- Exposure to the following areas should be given :-

Schedule of clinical postings for M.D Psychiatry *(36 months)

Area/ Specialty	
Ward and OPD (Concurrent)	18 months
Neurology	2 months
Emergency Medicine/ Internal Medicine	1 month
Consultation Liaison Psychiatry	3 months
Psychiatric hospital and Forensic Psychiatry	1 month
Clinical Psychology	1 month
Addiction Psychiatry	3 months
Child and Adolescent Psychiatry	3 months
Community psychiatry	2 months#
Elective posting	2 months (as per choice in the same Institute)

* The stated duration can be subjected to minor modifications depending on available resources

 # Exposure to community based services should be integral to various postings.

Applicable only for trainees in General Hospital Psychiatric units: Facilities for these need to be arranged.

The post graduate student in Psychiatric hospitals would have extended period of exposure to consultation - liaison psychiatry and other medical specialties. Exposure to community based services should be integral part of various postings. The post graduate student shall be given full responsibility for patient care and record keeping under the supervision of the senior PG students and consultants. The post graduate

student shall also take patients for psychological interventions in an individual as well as group setting. S/he must complete a minimum of 100 hours of supervised psychological interventions.

- **Inter-Unit Rotation of posting**

  Inter-unit rotation in the department should be done for a period of up to one year (divided during the first year and third year while the post graduate student stays in the parent unit throughout the duration of his thesis work).

17. **Clinical meetings:**

    There should be intra - and inter - departmental meetings for discussing the uncommon / interesting medical problems.

18. **Log book:**

    Each student must be asked to present a specified number of cases for clinical discussion, perform procedures/present seminars/review articles from various journals in inter-unit/interdepartmental teaching sessions. They should be entered in a Log Book and signed by the authorized teacher and Head of Department.

19. The Department should encourage e-learning activities.

During the training programme, patient safety is of paramount importance, therefore, skills are to be learnt initially on the models, later to be performed under supervision followed by performing independently. For this purpose, provision of clinical skills laboratories in medical colleges is mandatory. Objective structured clinical examination (OSCE) modules may be developed and used in teaching.

ASSESSMENT

FORMATIVE ASSESSMENT, ie., assessment during the training

Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self directed learning and ability to practice in the system.

Quarterly assessment during the MD training should be based on:

1. Journal based / recent advances learning
2. Patient based /Laboratory or Skill based learning
3. Self directed learning and teaching
4. Departmental and interdepartmental learning activity
5. External and Outreach Activities / CMEs
6. Professionalism and teamwork

The student to be assessed periodically as per categories listed in postgraduate student appraisal form (Annexure I).

SUMMATIVE ASSESSMENT, ie., at the end of training

The summative examination would be carried out as per the Rules given in POSTGRADUATE MEDICAL EDUCATION REGULATIONS, 2000.

The examination shall be in three parts:

1. **Thesis**

   Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination. The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination. A post graduate student shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners.

2. **Theory Examination:**

   There shall be four papers each of three hours duration.

   Paper I: Basic Sciences as related to Psychiatry

   Paper II: Clinical Psychiatry

   Paper III: Psychiatric Specialties

   Paper IV: Recent Advances

3. **Clinical/Practical and Oral/viva voce examination should consist of:**

   - Presentation of long case of Psychiatry
   - Neurology short case
   - A short case Psychiatry
   - Viva –voce

   Due importance should be given to Log Book Records and day-to-day observation during the training.

Recommended Reading

Books (latest edition)

1. Textbook of Psychiatry Publisher: Lippincott Williams and Wilkins, Editors: Benjamin James Sadock, Virginia Alcott Sadock, Pedro Ruiz
2. Kaplan and Sadock's Synopsis of Psychiatry, Editor: RJ Boland, ML Verduin, P Ruiz; Publisher: Wolters Kluver India
3. Introduction to Psychology by Clifford T. Morgan Editors: Clifford T Morgan, Richard A King, John R Weiss, John Schopler, Publisher: MC Graw Hill

4. New Oxford Textbook of Psychiatry Edited by: John R. Geddes, Nancy C. Andreas and Guy M. Goodwin, Publisher: Oxford
5. Stahl's Essential Psychopharmacology: Neuroscientific Basis and Practical Applications, Editor: Stephen M Stahl, Publisher: Cambridge
6. Forensic Psychiatry: RC Jiloha, D Kataria, P Kukreti (Jaypee)
7. ECT administration manual, NIMHANS Editors: Bangalore N Gangadhar, A Shyam Sundar, Jagadisha Thirthalli, Shivarama Varambally, Kesavan Muralidharan, C Naveen Kumar, Preeti Sinha, Biju Viswanath, Publisher: NIMHANS
8. Community Psychiatry in India (Eds Chavan, Gupta, Arun, Sidana, Jadav) Jaypee.
9. Fish's Clinical Psychopathology – Signs and Symptoms In Psychiatry By Patricia Casey, Editor: Patricia Casey, Brendan Kelly, Publisher: Tree Life Media
10. Sims Symptoms in the Mind: Textbook of Descriptive psychopathology, Editor: Femi Oyebode, Publisher: Elsevier
11. Bickerstaff's Neurological Examination in Clinical practice, Editor: Kameshwar Prasad, Ravi Yadav, John Spillane, Publisher: Wiley
12. A Primer of Research, Publication and Presentation: Sandeep Grover, Shahul Amin, Jaypee
13. Maudsley's Prescribing Guidelines in Psychiatry, Editors: Author: David M. Taylor, Thomas R. E. Barnes, Allen Young, Publisher: Wiley
14. Lishman's Organic Psychiatry Editor: Anthony S. David, Simon Fleminger, Michael D. Kopelman, Publisher: Wiley Blackwell
15. Kaufman's Clinical Neurology for Psychiatrists, Elsevier.

Journals

03-05 international Journals and 02 national (all indexed) journals.

Appendix 1

Student appraisal form for MD in Psychiatry

	Element	Less than Satisfactory			Satisfactory			More than satisfactory			Comments
		1	2	3	4	5	6	7	8	9	
1	**Scholastic Aptitude and Learning**										
1.1	Has Knowledge appropriate for level of training										
1.2	Participation and contribution to learning activity (e.g., Journal Club, Seminars, CME etc)										
1.3	Conduct of research and other scholarly activity assigned (e.g. Posters, publications etc.)										
1.4	Documentation of acquisition of competence (eg Log book)										
1.5	Performance in work based assessments										
1.6	Self- directed Learning										
2	**Care of the patient**										
2.1	Ability to provide patient care appropriate to level of training										
2.2	Ability to work with other members of the health care team										
2.3	Ability to communicate appropriately and empathetically with patients families and care givers										
2.4	Ability to do procedures appropriate for the level of training and assigned role										
2.5	Ability to record and document work accurately and appropriate for level of training										
2.6	Participation and contribution to health care quality improvement										
3	**Professional attributes**										
3.1	Responsibility and accountability										
3.2	Contribution to growth of learning of the team										
3.3	Conduct that is ethically appropriate and respectful at all times										
4	**Space for additional comments**										
5	**Disposition**										
	Has this assessment been discussed with the trainee?	Yes	No								
	If not explain										

	Name and Signature of the assesse										
	Name and Signature of the assessor										
	Date										

Module on Gender related Issues and Gender Dysphoria for the MD Curriculum of Psychiatry

At the end of the course the student will be able to:

- Demonstrate the ability to assess the gender identity of an individual and distress caused (if any) due to the individual's own gender identity in simulated environment.
- Describe and understand how to discuss sexual orientation, sexuality identity, gender identity, as well as intersex identity (differences in sex development) as part of routine history taking.
- Demonstrate the ability to educate and counsel individuals or family members about intersex variations, sexual orientations, sexuality identities, gender incongruence, gender dysphoria, and gender identities. Demonstrate ability to identify when a mental health referral is needed for the above.
- Demonstrate knowledge that conversion therapy practices for sexual orientation or gender identity or on people with intersex variations is unethical.
- Describe differences between Gender Incongruence and Gender Dysphoria.
- Describe and understand gender identity, the biological and gender binaries, rejection of gender binary, gender non-conforming, gender non-binary, androgynous, and other identities.
- Demonstrate the ability to educate an individual and family members that Gender Incongruence by itself is not a disorder and does not require clinical intervention. Any form of conversion therapy is unethical.
- Discuss situations where there is a role for mental health support in Gender Dysphoria i.e., discussing with family, deciding on hormonal treatments or Sex Reassignment Surgery (Gender Affirming Care or Gender Affirmative Therapies or Gender Confirmation Surgery).

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GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR MD IN ANAESTHESIOLOGY

Preamble

The purpose of PG education is to create specialists who would provide high quality health care and advance the cause of science through research & training.

A post graduate specialist having undergone the required training in anesthesiology should be able to recognize the health needs of the community. He or she should be competent to handle effectively medical problems and should be aware of the recent advances pertaining to his/her specialty. She/he should be highly competent anesthesiologist with broad range of skills that will enable him/her to practice anesthesiology independently. The PG student should also acquire the basic skills in teaching of medical/para-medical students. She/he is also expected to know the principles of research methodology and modes of consulting library. She/he should attend conferences, workshops and CMEs regularly to upgrade his/her knowledge.

The purpose of this document is to provide teachers and learners illustrative guidelines to achieve defined outcomes through learning and assessment. This document was prepared by various subject-content specialists. The Reconciliation Board of the Academic Committee has attempted to render uniformity without compromise to purpose and content of the document. Compromise in purity of syntax has been made in order to preserve the purpose and content. This has necessitated retention of “domains of learning” under the heading “competencies”.

SUBJECT SPECIFIC LEARNING OBJECTIVES

The training should have clear objective, is competency based, is well planned & evaluated, is supervised and delivered by well trained teachers. It will have special emphasis on attitude and behavior, safety, communication, presentation, audit, teaching, ethics and law and management.

No limit can be fixed and on the number of topics that can be prescribed as course contents. The student is expected to know his/her subject in depth from various text books and journals; however more emphasis should be on the diseases/health problems most prevalent in that area. Knowledge of recent advances and basic sciences as applicable to his/her specialty should get high priority. Competency in anaesthesia skills commensurate with the specialty (actual hand on training) must be ensured.

Specific learning objectives:

1. **Theoretical knowledge**: The student should have fair knowledge of basic sciences (Anatomy, Physiology, Biochemistry, Microbiology, Pathology, Pharmacology, Statistics and Physics) as applied to Anaesthesia. The student should acquire in-depth knowledge including recent advances. He/she should be fully conversant with the bedside procedures (diagnostic and therapeutic) and have knowledge of latest diagnostics and therapeutics procedures available including radiological methods.

2. **Teaching:** The student should learn the basic methodology of teaching and develop competence in teaching medical/paramedical students. The student should be familiar with the latest teaching (computer and power point presentation) modes including simulators training and evidence based medical education.
3. **Attitude development:** The student should develop attitude that leads to appropriate communication with colleagues to function in a group in Operating Room /Intensive Care Unit, and develop the ability to function as a leader in the operating room.

SUBJECT SPECIFIC COMPETENCIES

The student during the training programme, should acquire the following competencies:

A. Cognitive domain

- Demonstrate knowledge of Anatomy related to;
  - ❖ Diaphragm, upper and lower airway, heart and coronary circulation ,
  - ❖ Regional anaesthesia - field block, central neuraxial, blockade, block for acute pain states
  - ❖ Procedures like -Intramuscular injections, arterial and venous cannulations and
  - ❖ Patient Positioning under anaesthesia

- Demonstrate knowledge of Physiology of various systems (respiratory, cardiovascular, hepatobiliary, renal, endocrine, pregnancy, haematological, neuromuscular, regulation of temperature and metabolism, stress response, cerebral blood flow and ICP, central, autonomic and peripheral nervous systems, metabolic response to stress and trauma) in detail and translate its application in a problem solving manner.
- Demonstrate knowledge of Biochemistry relevant to fluid balance and blood transfusion, perioperative fluid therapy, acid base homeostasis in health and diseases.
- Demonstrate knowledge of commonly used drugs in anaesthesia practice (premedication, induction agents - intra-venous and inhalational, neuromuscular blocking agents and reversal of muscle relaxants) - general principles, concepts of

pharmacokinetics and pharmacodynamics, drug interactions with the other drugs taken concomitantly by the patient and anaphylactoid reactions.

- Demonstrate knowledge of gas laws, medical gas supply system, fluidics, electricity, diathermy and oxygen therapy.
- Demonstrate knowledge of 'principles of physics' that govern functions of basic anaesthesia delivery equipment, airway devices – (laryngoscopes, airways etc), breathing systems and monitors, fiber optics, Lasers, Pacemakers and defibrillators, monitoring equipments (used for assessment of cardiac functions, temperature, respiratory functions, blood gases, intracranial pressure, depth of anaesthesia and neuromuscular block), Sterilization of equipments, manufacture, filling and transport of gases and liquid oxygen. etc.
- Demonstrate knowledge of importance of pre-anaesthetic assessment and optimization of a patient; consisting of evaluation, interpretation of laboratory investigation as applied to the care of the patients in planning and conduct of general anaesthesia.
- Demonstrate knowledge of basic life support, advanced cardiac, trauma life support, and neonatal resuscitation according to latest guidelines.
- Demonstrate knowledge of principles of sterilization and universal precautions, selection, maintenance and sterilization of anaesthesia and related equipment, Infection control, cross contamination in OT and ICU. Immune response and anaesthesia.
- Describe the development and history of anaesthesia as a specialty with knowledge of important personalities who have contributed towards it.
- Demonstrate knowledge of principles of artificial ventilation, management of unconscious patients, oxygen therapy, shock- (pathophysiology and management) and various protocols related to Intensive Care Unit.
- Demonstrate knowledge of post-operative care in the post-anaesthesia recovery room, in terms of management of
    - ❖ Post-operative pain: various modalities
    - ❖ Nausea and vomiting
    - ❖ Identified emergencies and postoperative complications.
    - ❖ Special precautions to be taken in specific surgical patients.
- Demonstrate knowledge of acute pain management, chronic pain therapy & therapeutic nerve blocks, acupuncture, acupressure and other non-conventional methods of treatment.
- Describe documentation, medico-legal aspects of anaesthesia and concept of informed consent.
- Demonstrate knowledge of research methodology and basics of biostatistics relevant to data collection, analysis, record keeping in anaesthesia, comparison and estimation of significance.

- Demonstrate ability to interpret blood gas analysis and other relevant biochemical values, various function tests and basics of measurement techniques, ECG.
- Explain blood coagulation mechanism, and their disturbances, rational use of blood and blood components.
- Demonstrate knowledge pertaining to special anaesthetic techniques as relevant to:
    - ❖ Outpatient anaesthesia, hypotensive anaesthesia, anaesthesia in abnormal environments including rural area and calamitous situations
    - ❖ Associated medical disorders in surgical patients
    - ❖ Geriatric and pediatric anaesthesia, Emergency, ENT, orthopedic, ophthalmology, obstetrics, dental, radio-diagnosis and radiotherapy.
    - ❖ Induced hypothermia, incidental, environmental safety of patient.
    - ❖ Malignant hyperthermia, myasthenia gravis, GB syndrome and other neuromuscular diseases, obesity, COPD, Diabetes mellitus, bronchial asthma and hypertensive crises..
    - ❖ Principles of anaesthetic management of neuro/cardiac/thoracic/vascular/ transplantation/burns and plastic surgery.
    - ❖ Anaesthesia for patients with severe cardiac, respiratory, renal and hepatobiliary disorder posted for unrelated surgery
    - ❖ Shock, types, pathogenesis and management of patients in shock, renal failure, critically ill and/or on ventilator, Multiple organ failure
- Demonstrate knowledge pertaining to care of terminally ill, Hospices management, Do not resuscitate orders.
- Demonstrate knowledge of general principles of medical audit and Critical incident reporting.
- Demonstrate knowledge of Ethics and clinical trial.
- Demonstrate knowledge of Hospital, ICU and OT design and planning.
- Demonstrate knowledge of Medical education including evidence based medical education.
- Demonstrate knowledge of principles of human resources and material management.

B. Affective Domain:

1. Should be able to function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the patient and the clinician or other colleagues to provide the best possible diagnosis or opinion.
2. Always adopt ethical principles and maintain proper etiquette in dealings with patients, relatives and other health personnel and to respect the rights of the patient including the right to information and second opinion.

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3. Develop communication skills to word reports and professional opinion as well as to interact with patients, relatives, peers and paramedical staff, and for effective teaching.

C. Psychomotor domain

At the end of the course, the student should acquire skills in the following broad areas and be able to:

- Demonstrate ability **as a perioperative physician**, in terms of
  - ❖ Acquiring mastery in careful and relevant history taking, physical examination in clinical evaluation of the patient preoperatively.
  - ❖ Collecting and synthesizing preoperative data from parent hospital and other sources and to develop a rational strategy for the peri-operative care of the patient.
  - ❖ Thorough and systematic approach to preoperative evaluation of patients with and without systemic diseases, undergoing different types of operations.
  - ❖ Prioritizing problems, present cases clearly and systematically to attending consultants.
  - ❖ Developing working relationships with consultants in other specialties to assist in preoperative evaluation and get a good consultation.
  - ❖ Interacting with preoperative patients and developing effective counseling techniques for different anaesthetic techniques and peri-operative procedures.
  - ❖ Assessing and explaining risk of procedure and taking informed consent.
  - ❖ Managing information in preoperative evaluation and outcome enhancement and communication skill to patients and relatives.
  - ❖ Ability to choose and order the required investigations to be done in a particular patient peri operatively

- Demonstrate ability in performing
  - ❖ Pre-operative equipment check
  - ❖ selection of drugs
  - ❖ Preparation of work table etc.

- Identify conditions like difficult airway by following difficult airway algorithms.
- Demonstrate ability to establish topical airway anaesthesia for awake intubation
- Demonstrate management of a Failed intubation drill on a Mannequin according to latest guidelines
- Demonstrate ability to monitor and assess depth of anaesthesia
- Demonstrate abilities to manage body fluid composition; volume status; replacement of fluid and blood loss; use of whole blood and blood components.

- Demonstrate abilities to manage Electrolyte and acid base derangements; osmolarity and osmolality.
- Demonstrate acquisition of skills to initiate mechanical ventilation; select appropriate type and mode of ventilator; and monitor proper functioning of ventilator.
- Identify the need to perform intra-operative laboratory tests, blood gases, coagulation profile and interpret the results with clinical co relation
- Demonstrate ability to manage co-morbid conditions and anaesthesia
- Demonstrate ability to perform cannulation of arteries, central and peripheral veins.
- Demonstrate ability in using and interpreting the following routine non-invasive and invasive monitors intra-operatively:
    a. Electrocardiogram with ST-segment analysis
    b. Noninvasive blood pressure
    c. Capnograph: values and changes in values and waveform.
    d. Pulse oximetry: values and changes in values
    e. Neuromuscular blockade monitor
    f. Invasive arterial pressure: waveform and changes in the waveform
    g. Central venous pressure: values and waveform
    h. Pulmonary artery pressure: Values and waveforms, pulmonary capillary wedge tracing.
        i) Cardiac output
        ii) Mixed venous oxygen saturation
        iii) Evoked potential
        iv) Transesophageal echocardiography: basic understanding

- Demonstrate skills in providing basic life support, advanced cardiac life support, trauma life support and paediatric-neonatal life support, train medical and paramedical staff in BLS and ALS.
- Demonstrate mastery in common procedures like vascular access, use of latest invasive and non-invasive monitoring equipment, lumber puncture, management of appropriate mechanical ventilation and total care of Intensive Care Patient.
- Demonstrate ability to administer general anaesthesia and regional anaesthesia for ASA I to V, under supervision.
- Demonstrate ability to give extradural block (EDB) lumbar and thoracic, Spinal Block, and Peripheral Nerve Blocks under supervision.
- Demonstrate ability to use ultrasound machine for giving blocks and venous cannulation.
- Demonstrate ability to plan and administer anaesthesia to all emergency patients under supervision including patients for Cardiac, Neurosurgery, Pediatric surgery,

and for all major surgeries, able to manage critically ill patients and treat intractable pain.

- Demonstrate following abilities in **Emergency Anaesthesia, Trauma and Resuscitation:**
  - ❖ Organize resources in case of mass casualty.
  - ❖ Perform triage.
  - ❖ Assess, transport and manage mass casualties / disaster management and camp anaesthesia.
  - ❖ Manage massive haemorrhage and massive blood transfusion.
  - ❖ Transport critically ill patient.
  - ❖ Perform anaesthetic management of geriatric patients with fracture neck of femur
  - ❖ Manage severe burns patients, rapidly progressing spinal compression, massive haemoptysis and lobectomy, peritonitis from various suspected causes, preparation and management of bowel obstruction, septicaemic shock, acute upper airway obstruction such as foreign body, epiglottitis, infections, cardiac tamponade from examples post cardiac surgery, malignant pericardial effusion, peri-operative management of rupture aneurysm of abdominal aorta
  - ❖ Basic Cardiac Life Support and Advanced Cardiac Life Support, Basic Trauma Life Support, Advanced Trauma Life Support, and Cerebral preservation.
  - ❖ Management of intra-operative cardiac arrest
  - ❖ Management of intra-operative bronchospasm

- Demonstrate ability to document a Medico-legal aspect.
- Demonstrate ability to provide special sedation /**anaesthesia requirements outside operating Room,** eg **Radiology**: for CT, MRI (especially in relation to dye allergy and embolization, **Oncho radiotherapy**, **Electroconvulsive shock therapy** (modified ECT. **Non-invasive cardio-radiologic procedures** including balloon angioplasty and cardiac catheterization, **Non-invasive neuro-radiologic procedures, lithotripsy** etc **.**
- Demonstrate ability to analyze data and write a thesis, present scientific data, participate in anaesthesia audit.
- Demonstrate ability to critically review and acquire relevant knowledge from the journals about the new development in the specialty
- Demonstrate following abilities in the **Post Anaesthesia Care Unit (PACU)**
  - ❖ Assess the patient's recovery and condition for a safe discharge or transfer.
  - ❖ Observe, recognize and treat the commonly occurring problems likely to arise in the Post-anaesthsia Care Unit (PACU) especially those in relation to cardio-respiratory systems:
    1. Airway integrity and compromise.

2. Arrhythmia
3. Hypertension
4. Hypotension
5. Pain prevention and pain relief
6. Nausea and vomiting
7. Decreased urine output
8. Emergence delirium
9. Delayed emergence from anaesthesia
10. Shivering
11. Post-obstructive pulmonary edema.

- ❖ Assess patient recovery and the parameters for transfer from the PACU to the ward, ICU, home.
- ❖ Score the patient's condition according to the Aldrete system, including fast tracking after out-patient surgery.

- Demonstration of following abilities in **Intensive Care Unit**
  - ❖ **Understanding the spectrum of critical illnesses requiring admission to ICU.**
  - ❖ Recognizing the critically ill patient who needs intensive care -Trauma, burns, all types of shock, Sepsis, SIRS and ARDS, Poisoning, infectious patient (HIV, Hepatitis) and patients with metabolic disturbances.
  - ❖ Monitoring progress of patients by physiological scoring systems
  - ❖ Practicing infection control practices and control of nosocomial infections.
  - ❖ Inserting central venous lines, arterial lines using ultrasound and interpreting the data.
  - ❖ Managing cardiovascular instability, respiratory failure and postoperative pulmonary complications
  - ❖ Understanding of the operation of mechanical ventilators including different ventilatory modalities non-invasive ventilation, complications and modes of weaning.
  - ❖ Principles and application of Oxygen Therapy
  - ❖ Glycemic control in the critically ill patient
  - ❖ Practice of Hypothermia and prevention of cerebral injury after cardiac arrest
  - ❖ Delivering appropriate nutritional support - enteral and parenteral.
  - ❖ Proper use of sedative/hypnotic drugs in the ICU.
  - ❖ Practicing ethical and legal aspects of critical care
  - ❖ Good communication skills with patient and relatives.
  - ❖ Proper Sterilization of ICU equipment.

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- Demonstration of following abilities in **Acute and Chronic Pain Management**
  - ❖ Assessment of patients with pain including: history taking, physical examination, and interpretation of investigations.
  - ❖ Classify types of pain - acute chronic, traumatic, cancer pain, etc. with the knowledge of Pain pathways in detail.
  - ❖ Practice the different modalities of physical therapy that may relieve both acute and chronic pain
  - ❖ Practice the acute pain, cancer pain guidelines and WHO treatment ladder.
  - ❖ Practice routes of administration and risk/benefits of drugs used for acute and chronic pain relief, patient controlled analgesia and treat the common pain syndromes.
  - ❖ Demonstrate practice of pain management in patients with problem drug use, drug dependency and addiction and identify the parameters for referral to a pain medicine specialist.
- Demonstrate Organization of acute pain service and role of acute pain nurse for pain assessment in various groups of patients, Physiological changes secondary to Pain, practice different modalities of pain control. Pharmacology and side effects of opioid analgesia and non-opioid analgesia, principle of patient-controlled analgesia and assessment of its efficacy, Pharmacology and side effects of epidural/intra-thecal opioid. Neurological assessment of epidural blockade and management of failed block. Management of regional blockade – brachial plexus, para-vertebral and intra-pleural block. Management of epidural abscess. Substance abuse and acute pain control. Pain control in concurrent medical diseases – COAD, IHD, bleeding tendency, geriatric. Pain control in burns patients. Pain control in trauma patients included multiple rib fracture
- Demonstration of abilities to manage **Chronic Pain**
  - ❖ Practice different modalities of chronic pain management - physical therapy, psychotherapy, (including cognitive behavioural approaches), neuro-ablation, neuro-augmentation, spinal opioid, interventional neuro-blockade, non-opioid analgesia.
  - ❖ Anatomy, indication, technique and complication of chemical sympathectomy (lumbar sympathectomy, stellate ganglion block, celiac plexus block).
  - ❖ Practice principles of management of cancer pain, principle of management of non-cancer neuropathic pain - phantom limb pain, post-herpetic neuralgia, complex regional pain syndrome, trigeminal neuralgia. Principle of management of non-cancer nociceptive pain - myofascial pain, lower back pain, intractable angina, burns, chronic pancreatitis, PVD.
  - ❖ Practice Epidural steroid injection (all levels) and long-term epidural catheterization.
  - ❖ Observe and practice following blocks: Infra-orbital nerve, Intercostal nerve

- ❖ Recognize complications associated with each blocks and know appropriate treatment of each
- ❖ Know the indications for stimulation techniques such as transcutaneous electrical nerve stimulation (TENS), dorsal column stimulation, and deep brain stimulation.
- ❖ Mechanisms and side effects of other therapies used for treating pain.
- ❖ The principles of pain management in special patient groups including the elderly, children, disabled, intellectually handicapped and those unable to communicate.
- ❖ Awareness of the principles for insertion and management of implantable drug delivery pumps.
- ❖ Awareness of the basic principles of palliative care.

- **Demonstrate practice of Regional Anaesthesia**
  - ❖ Applying general principles of pharmacology of local anaesthetics and various adjuvants.
  - ❖ Familiarizing with the relevant anatomy for regional techniques.
  - ❖ Application of indications and contraindications to regional anesthetic technique including central neuraxial blocks, peripheral nerve blocks and sympathetic nerve blocks.
  - ❖ Assessing adequacy of regional anaesthesia, and learn techniques of supplementation of inadequate blocks.
  - ❖ Providing effective anxiolytics and sedation of patients by both pharmacologic and interpersonal technique.
  - ❖ Performing the following regional anaesthesia techniques:
    - o Brachial plexus, cervical plexus, stellate ganglion block, lumbar plexus, lumbar sympathetic, Sciatic nerve block, Femoral nerve block, 3 in 1 block, Wrist block, Popliteal Nerve block, Trigeminal nerve block, Retro bulbar blocks, Paravertebral blocks, Intercostal blocks, Caudal block – adult and pediatric, Ankle block, Epidural block/Catheter, Subarachnoid block, Bier's block, All peripheral nerves of the upper and lower limbs.

- **Demonstrate practice of Thoracic Anaesthesia**
  - ❖ Pre-operative assessment of patients undergoing Thoracotomy (lung resection), thoracoscopy, video assisted thoracoscopy and mediastinoscopy
  - ❖ Various approaches and their relevant equipments for lung isolation.
  - ❖ Various double lumen tubes and their placement.
  - ❖ Application of Principle of chest drain.
  - ❖ Respiratory Physiology and management of one lung ventilation (OLV). Indications, contraindications and hazards of OLV.

- ❖ Application of the knowledge of Anatomy of lung and broncho-pulmonary segments.
- ❖ Anatomy and techniques for intercostals nerve block and thoracic epidural. Management of thoracic epidural anaesthesia and analgesia
- ❖ Anatomy, techniques and placement of paravertebral block/catheter.
- ❖ Post-operative care of patients after lung surgery.
- ❖ Peri-operative management of patients with myasthenia gravis.
- ❖ Peri-operative management of patients with mediastinal mass.
- ❖ Anaesthetic management of mediastinoscopy, major airway stenting.
- ❖ Lung volume reduction surgery and problems.

- **Demonstrate practice of Cardiovascular Anaesthesia**:

  - ❖ Application of the knowledge of Anatomy and physiology of valvular disease, coronary arteries and their territories. Pulmonary circulation, coronary circulation, cerebral circulation, visceral circulation.
  - ❖ Application of the knowledge of Distribution of blood volume to different organs and systems and their control. Microcirculation. Venous system, venous pressure, its influence on various functions.
  - ❖ Regulation of blood pressure, hypotensive anaesthesia.
  - ❖ Anatomy and physiology of all operable congenital heart disease like ASD, VSD, PDA, TOF, transposition of great vessels.
  - ❖ Application of the knowledge of anatomy and physiology of vascular heart disease like co-arctation of aorta.
  - ❖ Assessment of cardiac patient with ischaemic heart, valvular heart disease and other diseases listed above. Understanding of cardiac catheterization, echocardiography, stress testing, and radio-nucleide imaging.
  - ❖ Application of Principle and complication of cardiopulmonary bypass
  - ❖ Application of Principle of trans-esophageal echocardiography
  - ❖ Application of Principle of circulatory support: inotropes, IABP, pacing
  - ❖ Coagulation and management of coagulopathy.
  - ❖ Off pump bypass
  - ❖ Intra-operative management of aortic surgery and major peripheral vascular surgery, aneurysm grafts, recanalisation procedures.
  - ❖ Understanding of the adult patient with congenital heart disease and their management during anaesthesia.
  - ❖ Postoperative cardiac critical care, including cardiovascular problems, analgesia.
  - ❖ Insertion of invasive monitoring for arterial monitoring, central venous pressure monitoring, pulmonary artery catheter insertion and interpretation.
  - ❖ Robotic cardiac surgery.

- **Demonstrate practice of Paediatric Anaesthesia**
  - ❖ Application of knowledge of Anatomical changes in paediatric patient and neonates.
  - ❖ Application of knowledge of Physiology and pharmacology in paediatric patient.
  - ❖ Guideline for pre-operative fasting in children and pre-medication.
  - ❖ Anaesthetic equipment: laryngoscopes, airways, endotracheal tubes, LMAs, PLMA and breathing circuit for children.
  - ❖ Anaesthesia management for premature and newborn.
  - ❖ Emotional problems for parent and child and principles of premedication. Consent by parents and their presence during induction. To become skilled in communicating with children, parents and other relatives.
  - ❖ Problems of transporting a sick pediatric patient from the ward to the operating room and back with regard to temperature maintenance, cardiovascular stability, ventilation and oxygenation.
  - ❖ Estimate preoperatively blood volume, hourly fluid requirements, fluid deficit, third space loss, acceptable blood loss and apply principles of fluid and blood replacement in the perioperative period.
  - ❖ Induce and maintain anaesthesia by inhalation, intravenous, intramuscular and rectal routes and monitor pediatric patients.
  - ❖ Understand the benefits, risks and techniques of regional anaesthesia in children. Anatomy and techniques of caudal, dorsal penile and inguinal regional block, spinal and epidural block
  - ❖ Learn to recognize and treat post anaesthesia complications like apnea, laryngospasm, acid-base and electrolyte disturbances, febrile and convulsing child and bleeding child.
  - ❖ Common problems related to common congenital syndromes presenting for surgery. Anaesthetic management of a child with concurrent disease – Down's, Pierre Robin syndrome, von Willebrand's disease, Goldenhar's, Sturge-Weber, Tracher-Colin, Prune-Belly, and cyanotic and non-cyanotic congenital heart disease.
  - ❖ Paediatric resuscitation: drugs, doses and defibrillation of children of all ages, from the very premature neonates to those children with complex coexisting disease.
  - ❖ Management of patients requiring paediatric intensive care, ventilatory management, and support of circulation.
  - ❖ Resuscitation of neonates and children of all ages. A period of one to two months in a PICU is recommended for all post graduate students undergoing advanced training in paediatric anaesthesia.
  - ❖ Paediatric pain management
  - ❖ Assessment of a child with URTI, with a heart murmur.
  - ❖ Management of fluid and electrolytes in children.

- ❖ Anaesthetic management of a malignant hyperthermia susceptible child.
- ❖ Anaesthetic management of FB bronchus, oesophagus, Wilm's tumour, congenital diaphragmatic hernia, tracheo-oesophagus fistula, thoracotomy.
- ❖ Anaesthesia for Fetal Surgery.
- ❖ Sedation techniques including the selection, management and monitoring of children for diagnostic and therapeutic procedures, with particular attention to working in areas outside the theatre suite.

- **Demonstrate practice of Transplant anaesthesia**
  - ❖ Application of knowledge of basic pathophysiology of renal and liver failure. Principles of anesthetizing an immuno-compromised patient.
  - ❖ Principles of anesthetizing patient with end stage renal/liver disease and patient with organ transplantation. Perioperative management.
- **Demonstrate practice of Neuroanaesthesia**
  - ❖ Application of basic knowledge of cerebral circulation and intra cranial pressure and its implications
  - ❖ Anaesthesia to patients with neurologic disease, head injury undergoing neurologic or non-neurologic surgery and for diagnostic procedures requiring anaesthesia.
  - ❖ Anesthetic implications of the most common neurosurgical procedures, transnasal, trans-sphenoidal pituitary surgery. Posterior fossa surgery. Surgery for supratentorial pathology.
  - ❖ Application of basic concepts behind electrophysiologic monitoring of the brain and spinal cord.
  - ❖ Application of knowledge of general principles of positioning the patient for surgery and the advantages and disadvantages of each position.
  - ❖ Effects of anaesthesia on the electroencephalogram (EEG) and evoked potentials.
  - ❖ Differential diagnoses and treatment alternatives of intraoperative intracranial hypertension ("tight brain")
  - ❖ Management of Head Trauma, and its anesthetic management and various protocols regarding their management and associated trauma.
  - ❖ Intracranial surgery and spinal surgery, both routine and emergency.
  - ❖ Monitoring: techniques for detection and management of air embolism.
  - ❖ Lumbar puncture and CSF drainage.
  - ❖ Non-surgical management of the head trauma patient, Systemic complications of severe brain injury.
  - ❖ Management of subarachnoid haemorrhage and vasospasm.
  - ❖ Diagnosis and management of patients with brainstem death; and dealing with patient's relatives

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- **The following are special procedures which the post graduate student must be able to perform**

Sr. No.	**Name of procedure**
1.	Blind Nasal intubation
2.	Failed intubation drill (includes Fiberoptic Laryngo/ Bronchoscope)
3.	Double Lumen Tube
4.	Bronchial Blocker placement
5	Jet Ventilation
6.	Suctioning and physiotherapy of wet lung
7.	Intubation in Neonates
8.	Initiation and management of ventilation
9.	Combined Spinal Epidural
10.	Brachial Plexus Block
11.	Intravenous Regional Anaesthesia
12.	Elbow, Wrist, Digital, Sciatic, Femoral, Lateral Cutaneous Nerve of thigh, Ankle - each
13	Cervical-Superficial and Deep, Stellate, Splanchnic - each
14.	Central Venous Line by Brachial, Jugular and Subclavian veins
15.	Radial and Femoral Artery cannulation
16.	CVP monitoring
17.	Pulmonary Capillary Wedge Pressure
18.	Neuro-muscular transmission Monitoring
19.	Anaesthetic Depth eg. BIS monitoring

- Demonstration of anesthetic abilities in the intraoperative period keeping into consideration the specific requirement of the surgical procedure – ENT, Orthopaedic, Gynaecology – Obstetrics, General surgery, Onchosurgery, replacement surgeries, urosurgery, vascular, plastic, Thoracic, Dental etc

Suggested Time Frame for Training the PG Students:

The student should be taught as per the following schedule to acquire the skills:

1. **First 6 months:**
   - During the first 6 months, the student should be taught expertise in the management of uncomplicated cases not belonging to any super specialty (ASA I and II cases). To start with, the student will observe and slowly become independent in giving general anaesthesia and spinal aneasthesia to ASA I and II cases for minor and major surgery, under graded supervision.
   - The postgraduate student should learn the basic principles of safe and effective anaesthesia, resuscitation, and both the prevention and treatment of pain,

perioperative care of the surgical patient, care of handling equipments, basic techniques in anaesthesia, and anaesthetic pharmacology, and electrical safety.

- He/she should select the thesis topic and submit the protocol for his thesis.

2. Next 18 months

- The student should widen his experience and should be able to undertake anaesthetic care of all routine cases, assist in the anaesthetic care for routine obstetric practice, understand basic principles of critical care, pain management, and participate in audit.
- The student should be trained in administration of general anaesthesia and regional anaesthesia for ASA I to V under supervision. The student should be able to give extradural block (EDB) lumbar and thoracic, Spinal Block, and Peripheral Nerve Blocks under supervision, and use of Ultrasound machine for giving blocks and venous cannulation. The student should learn paediatric and trauma life supports and maintain skills for basic and advanced cardiac life support.
- It is advised that they should be posted in the following specialties: general surgery including gastrointestinal surgery, transplant, ENT, Urology, Obstetrics, Dental Surgery, Eye, ICU, Pain Clinic and peripheral theatres like ECT, radiodiagnostic and therapeutic procedures (CT scan, MRI scan, angiography).
- The student should be able to analyze data and write a thesis. He/she should be able to present scientific data.

3. Last 12 months

- Thesis should be submitted minimum of 6 months before the final MD examination.
- The post graduate student should be given experience of various super-specialties like cardiothoracic and vascular surgery, neurosurgery and transplantation, and paediatric surgery. The student should be able to plan and administer anaesthesia to all emergency patients under supervision including patients for Cardiac, Neurosurgery, Pediatric surgery, and for all major surgeries. The aim at the end is to be competent and independent soon after the third year of junior residency in providing anaesthesia to elective and emergency cases.
- The post graduate student should be able to manage critically ill patients and treat intractable pain. They should also know how to organize resources in case of mass casualty. The curriculum should be able to provide 04 months of elective Intensive Care Unit posting (2 months during initial years under supervision and 2 months independently in the last six months).

4. At the end of 3 years, the post graduate student should have the skills to:

- Plan and conduct anaesthesia and provide post-operative care including pain relief for elective and emergency surgical procedures related to all surgical specialties.

- Carry out basic life support (BLS) and advanced life support (ALS) and train medical and paramedical staff in BLS and ALS.
- Manage patients admitted to an intensive care unit with the help of latest equipment.
- Manage patients suffering from acute and chronic intractable pain.
- Organize the hospital environment to manage mass casualty situation and camp anaesthesia.
- Critically review and acquire relevant knowledge from the journals about the new development in the specialty.
- Should be able to participate in anaesthesia audit.

Overall the student should acquire skills in the following practical competencies:

- ❖ Information management in preoperative evaluation and outcome enhancement and communication skill to patient and relatives.

Syllabus

The course content of **1st year** should cover the following:

1. **Anatomy related to:**
    - Diaphragm, upper and lower airway
    - Regional anaesthesia, field block, central neuraxial, blockade, block for acute pain states
    - Intramuscular injections, arterial and venous cannulations and positioning.
2. **Physics related to:**
    - Anaesthesia machine - assembly of necessary items.
    - Airway equipment including laryngoscopes, airway devices
    - Breathing systems
    - Monitoring in anaesthesia with concepts of minimum monitoring
    - Gas laws, medical gas supply system
    - Fluidics
    - Electricity and diathermy
    - Oxygen therapy
3. **Physiology related to:**
    - Theories of anaesthesia
    - Respiratory, cardiovascular, hepatobiliary, renal and endocrine system, pregnancy, blood, muscle and N-M junction, Nerve impulse transmission, ECG, regulation of temperature and metabolism, stress response, cerebral blood flow and ICP.

- Central, autonomic and peripheral nervous systems.
- Metabolic response to stress and trauma.

4. **Pharmacology related to**

    - General principles, concepts of pharmacokinetics and pharmacodynamics
    - Drug interactions in anaesthesiology, anaphylactoid reactions
    - Drugs used for premedication, induction of anaesthesia, general anaesthetics- intra-venous and inhalational, neuromuscular block and reversal of muscle relaxants.

5. **Biochemistry** relevant to fluid balance and blood transfusion, perioperative fluid therapy, acid base homeostasis in health and diseases.
6. Theoretical background of the commonly used anaesthetic techniques of general and regional anaesthesia, general principles of pre-anesthetic assessment and medication, recovery from anaesthesia and post operative care, effects of positioning during anaesthesia.
7. Introduction to the operation theatre, post-anaesthesia care rooms
8. Introduction to acute, chronic pain and pain management.
9. Documentation and medico-legal aspects of anaesthesia. Defensive anaesthesia. Concept of informed consent.
10. Resuscitation - basic and advanced life support (cardiac and trauma life support), neonatal resuscitation.
11. Intensive care of critical patients with introduction to artificial ventilation, management of unconscious patients, oxygen therapy, shock - pathophysiology and management.
12. Introduction to Research methodology, basics of biostatistics.

The course content of **2nd year** should cover the following:

Anatomy related to blocks for chronic pain, chemical neurolysis and different organ systems.

1. **Physics related to:**
    - equipments used in anaesthesia monitors, ventilators, vaporizers,
    - fibroptics.
    - Laser
    - Pacemaker and defibrillator
    - Monitoring equipment used for assessment of cardiac functions, temperature, respiratory functions, blood gases, intracranial pressure, depth of anaesthesia and neuromuscular block.
    - Sterilization of equipment
    - Computers in anaesthesia

2. Pharmacology of drugs used in cardiovascular, respiratory, endocrine, renal diseases and CNS disorders.
3. Interpretation of blood gases and other relevant biochemical values, various function tests and basics of measurement techniques, ECG.
4. Blood coagulation mechanism, disturbances, blood components.
5. Special anaesthetic techniques as relevant to –

    - Outpatient anaesthesia, hypotensive anaesthesia, anaesthesia in abnormal environments including rural area and calamitous situations
    - Associated medical disorders in surgical patients

6. Geriatric and pediatric anaesthesia
7. Emergency, ENT, orthopedic, ophthalmology, obstetrics, dental, radio-diagnosis and radiotherapy.
8. Medical statistics relevant to data collection, analysis, record keeping in anaesthesia, comparison and estimation of significance.
9. Care of terminally ill, Hospices management. Do not resuscitate orders.
10. Postures and anaesthesia.
11. Induced hypothermia, incidental, environmental safety of patient.
12. Malignant hyperthermia, myasthenia gravis, GB syndrome and other neuromuscular diseases, obesity, COPD, Diabetes mellitus, bronchial asthma and hypertensive crises..
13. Third world anaesthesia.
14. Inherited metabolic diseases and anaesthesia.

The course contents of **3rd year** should cover the following:

1. Principles of anaesthetic management of neuro/cardiac/thoracic/vascular/ transplantation/burns and plastic surgery.
2. Anaesthesia for patients with severe cardiac, respiratory, renal and hepatobiliary disorder posted for unrelated surgery
3. Shock, types, pathogenesis and management of patients in shock, renal failure, critically ill and/or on ventilator.
4. Multiple organ failure
5. Infection control, cross contamination in OT and ICU.
6. Immune response and anaesthesia.
7. Concept of cytokines, and other enzymes.
8. Selection, maintenance and sterilization of anaesthesia and related equipment
9. Chronic pain therapy and therapeutic nerve blocks.
10. Acupuncture, acupressure and other non-conventional methods of treatment.
11. Principles of neonatal resuscitation, ventilation and critical care.
12. Principles of human resources and material management.

13. General principles of medical audit. Critical incident reporting
14. Ethics and clinical trial.
15. Hospital, ICU and OT design and planning.
16. Medical education including evidence based medical education.

TEACHING AND LEARNING METHODS

Postgraduate Training

Teaching methodology

Didactic lectures are of least importance.

- Teaching should include seminars, journal clubs, symposia, tutorials, case discussions, and research presentations.
- Reviews and guest lectures should get priority for theoretical knowledge.
- Bedside teaching, grand rounds, interactive group discussions and clinical demonstrations should be the hallmark of clinical/practical learning.
- Student should have hands-on training in performing various procedures (medical/surgical concerning his specialty) and ability to interpret various tests/investigations.
- Exposure to newer specialized diagnostic/therapeutic procedures concerning his/her subject should be given.
- A postgraduate student of a postgraduate degree course in broad specialities/super specialities would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.
- Log books shall be maintained regularly and should be checked and assessed periodically by the faculty members imparting the training.
- The postgraduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.
- Department should encourage e-learning activities.

Thesis: Supervision

- The postgraduate is responsible to a Faculty member and the latter should be available to advise and assist the student in his clinical assignments
- Departmental teaching committee will be responsible for the educational activities of the department and the teaching schedule.
- This involves providing services for emergencies and it makes different demands upon the anaesthesiologist. It should be learned through experience, with reduced staff. The clinical work during emergency should have a close supervision. The standards should be maintained of the agreed competence on schedule. The

emergency duties should be properly arranged with duty off. The postgraduates may have to do emergency duty as per schedule

During the training programme, patient safety is of paramount importance; therefore, skills are to be learnt initially on the models, later to be performed under supervision followed by performing independently; for this purpose, provision of skills laboratories in medical colleges is mandatory.

Simulators:

Simulators should be used for the events of high importance but infrequent occurrence and where there may be high risks to the patients. The simulators can also be used for assessment purposes.

Rotation:

Schedule for three years of MD Anaesthesia postings:

The post graduate student should be exposed to the following areas of clinical anaesthesia practice:

1. Pre-anaesthesia clinic
2. Pain clinic
3. Recovery and Post anaesthesia Care Unit (PACU)
4. Intensive Care Units
5. Dialysis and transplant
6. All specialty theatres
7. Peripheral areas: Radiology, MRI, ECT and other interventional laboratories

The suggested schedule of the Operating Theatre can be as follows: This may change as per availability of specialities.

Operation theatre	**Months**
General Surgery	6
Urology	1
Ophthalmology	1
Otorhinology	2
Dental	1
Orthopedics/Trauma/casualty	3
Gynecology	3
Obstetrics	3
Pediatrics surgery	2
Burns/Plastic	1
CTVS	2
Neurosurgery	2

ICU	4
Pain	1
Recovery	1
Organ Transplant posting in the other areas. ECT, Cardiac Cath)	(Radiology,Radiotherapy)

ASSESSMENT

FORMATIVE ASSESSMENT, during the training programme

Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self directed learning and ability to practice in the system.

General Principles

Internal Assessment should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills. The Internal Assessment should be conducted in theory and clinical examination. The thesis is assessed separately.

Quarterly assessment during the MD training should be based on:

1. **Journal based / recent advances learning**
2. **Patient based /Laboratory or Skill based learning**
3. **Self directed learning and teaching**
4. **Departmental and interdepartmental learning activity**
5. **External and Outreach Activities / CMEs**

The student to be assessed periodically as per categories listed in postgraduate student appraisal form (Annexure I)

SUMMATIVE ASSESSMENT ie., assessment at the end of training

The summative examination would be carried out as per the Rules given in **POSTGRADUATE MEDICAL EDUCATION REGULATIONS, 2000.**

Post graduate Examination

The examinations shall be organised on the basis of 'Grading'or 'Marking system' to evaluate and to certify post graduate student's level of knowledge, skill and competence at the end of the training. Obtaining a minimum of 50% marks in 'Theory' as well as 'Practical' separately shall be mandatory for passing examination as a whole. The examination for M.D./ MS shall be held at the end of 3rd academic year. An academic term shall mean six month's training period.

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The final examination consists of three parts:

1) Thesis
2) Theory evaluation
3) Practical/Clinical and Oral evaluation

1. Thesis

Every post graduate student shall carry out work on an assigned research project under the guidance of a recognised Post Graduate Teacher, the result of which shall be written up and submitted in the form of a Thesis. Work for writing the Thesis is aimed at contributing to the development of a spirit of enquiry, besides exposing the post graduate student to the techniques of research, critical analysis, acquaintance with the latest advances in medical science and the manner of identifying and consulting available literature.

Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination. The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination. A post graduate student shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners.

2. Theory consists of four papers of 3 hours each having 10 short structured questions with 10 marks each:

Paper I: Basic Sciences as applied to Anaesthesiology

Paper II: Practice of Anaesthesia: Anaesthesia in relation to associated systemic and medical diseases.

Paper III: Anaesthesia in relation to subspecialties/superspecialties

Paper IV: Intensive Care Medicine, Pain Medicine and Recent advances.

3. Practical/Clinical Examination: will consist of: 3 clinical cases,

Long case: One, duration 30 min (history, examination, Diagnosis and Management, Discussion)

Short cases: Two, 15 minutes each for short case. In short cases only relevant history important to anaesthesia to be taken (history, clinical examination and diagnosis, discussion).

Oral/Viva-voce should be conducted preferably on four tables with one examiner on each table:

Table one: ECG, X-rays, ABG Cards, Pulmonary function tests, Capnographs, clinical exercises card. Table two: Anaesthetic Drugs, Emergency Drugs, IV Fluids, Nerve Bocks (skeleton) .

Table three: Anaesthesia machine including circuits and Vaporizers, ETT, Supraglottic Airway devices, ICU Ventilator and oxygen therapy equipment.

Table four: Resuscitation equipments, resuscitation demonstration, Difficult Airway Equipment, monitoring equipments.

Alternatively,

1. One long case, viva voce at one station with all examiners, and : 150 marks
2. 28 OSCE station covering two stations of short cases, drugs ECG, X-rays, PFT, ABG, Respiratory loops, Resuscitation etc.,: 150 marks

Recommended Reading

Books (latest edition)

1. Lee's Synopsis of Anaesthesia
2. Clinical Anesthesiology by Morgan
3. Cardiac Anaesthesia By Joel Kaplan
4. Clinical Anaesthesia by Barash, Cullen and Stoelting
5. Textbook of Anaesthesia by Aitkenhead Rowbotham and Smith
6. Anaesthesia for neonates and infants by Smith
7. Pharmacology and Physiology for Anaesthetists by Stoelting
8. Principles of Obstetric Anaesthesia by Craford
9. Miller's Anesthesia
10. Stoelting RK, Miller RD Basics of Anaesthesia
11. ICU Book, Paul Marino
12. Text Book of Critical Care, by Fink et al
13. Regional Anaesthesia, P Prithviraj
14. Practical Management of Pain, Raj
15. Stoelting and Dierdorf: Anaesthesia and Co-existing Disease
16. Dorsch and Dorsch: Understanding Anaesthesia Equipments
17. ECG by Shamroth/Goldman
18. Anatomy for Anaesthetists by Harold Ellis
19. Clinical Anesthesia by P.G.Barash
20. Longneckers Anaesthesiology- Mcgraw Hill

Must refer:

1. Cucchiara and Michenfelder: Clinical Neuroanaesthesia
2. Cottrell and Smith: Anaesthesia and Neurosurgery
3. Complications in Anaesthesiology by Orkin
4. Complications in Anaesthesia by Raven
5. Airway management by JL Benumof
6. Obstetric Anaesthesia by Chestnut

Journals

03-05 international Journals and 02 national (all indexed) journals

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Annexure I

Postgraduate Students Appraisal Form
Pre / Para /Clinical Disciplines

Name of the Department/Unit :

Name of the PG Student :

Period of Training : FROM……TO……

Sr. No.	PARTICULARS	Not Satisfactory	Satisfactory	More Than Satisfactory	Remarks
		1 2 3	4 5 6	7 8 9	
1.	Journal based / recent advances learning				
2.	Patient based /Laboratory or Skill based learning				
3.	Self directed learning and teaching				
4.	Departmental and interdepartmental learning activity				
5.	External and Outreach Activities / CMEs				
6.	Thesis / Research work				
7.	Log Book Maintenance				

Publications **Yes/ No**

Remarks*_____
_____
_____
____

***REMARKS: Any significant positive or negative attributes of a postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.**

SIGNATURE OF ASSESSEE **SIGNATURE OF CONSULTANT** **SIGNATURE OF HOD**

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GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR MD IN COMMUNITY MEDICINE

Preamble

The purpose of PG education is to create specialists who would provide high quality health care and advance the cause of science through research & training.

Community Medicine is an academic subject, a branch of Medicine which deals with promotion of health and prevention of diseases, involving people's participation, utilizing professional management skills. The Community Medicine specialist, will inculcate a holistic view of health and medical interventions primarily focused on Community Health/Population Health. Thus, he/she should be equipped with the knowledge, skills, competencies in primary, secondary & tertiary care, control and prevention of outbreaks/epidemics, community diagnosis, health needs assessment, epidemiological assessment, research and planning evidence-based health policies and programmes.

The Guidelines for teaching Community Medicine, therefore, should be designed to create a cadre of professionals who are competent to meaningfully contribute their expertise in planning, implementation, co-ordination, monitoring, evaluation of Primary Health Care Programs based on scientific evidence. The competencies must cover a wide spectrum of skills viz., technical, managerial, administrative, organizational skills, applied skills in Health Information Management, software application and soft skills of communication, motivation, decision-making, team building, training in scientific communication and medical writing.

The purpose of this document is to provide teachers and learners illustrative guidelines to achieve defined outcomes through learning and assessment. This document was prepared by various subject-content specialists. The Reconciliation Board of the Academic Committee has attempted to render uniformity without compromise to purpose and content of the document. Compromise in purity of syntax has been made in order to preserve the purpose and content. This has necessitated retention of "domains of learning" under the heading "competencies".

SUBJECT SPECIFIC OBJECTIVES

1. To create a skilled cadre of medical professionals having expertise in application of principles of Public Health, Community Medicine and applied epidemiology, contributing meaningfully in formulating National Health Policies & Programmes with a systems approach for overall human development.
2. To standardize the teaching & training approaches at post- graduate level, for Community Medicine

3. Research: To formulate research questions, do literature search, conduct study with an appropriate study design and study tool; conduct data collection and management, data analysis and report.

SUBJECT SPECIFIC COMPETENCIES

At the end of the course the student should be able to acquire the following competencies under the three domains, Cognitive, Affective and Psychomotor:

A. Cognitive domain (The student should be able to:)

1. Describe conceptual (and applied) understanding of Public Health, Community Medicine, clinical and disease-oriented approach, preventive approach & health promotion, disease control & promotion.
2. Have knowledge about communicable and non-communicable diseases, emerging and re-emerging diseases, their epidemiology, control and prevention.
3. Apply the principles of epidemiology, health research and Bio-statistics, application of qualitative research methods
4. Calculate Odds Ratio, Relative Risk, Attributable risk and other relevant health and morbidity indicators.
5. To describe nutritional problems of the country, role of nutrition in health and disease and to describe common nutritional disorders
6. Develop nutrition plan for an individual based on his requirements and with concerns to special situations if applicable
7. Plan comprehensive programme to address issue of malnutrition in a given area for a specific group
8. To describe the concept of Environmental Health and its various determinants.
9. Identify environmental health issues in a given area/community
10. Assess impact of adverse environmental conditions on health of human beings
11. Plan awareness programmes at various levels on environmental issues and mobilize community resources and participation to safeguard from local adverse environmental conditions
12. Should be able to provide technical advice for water purification, chlorination, installing gobar gas plant, construction of soakage pits etc.
13. Be a technical expert to advice on protection measures from adverse environmental exposure
14. To describe the working of Primary Health Care system, Panchayat Raj system, National Health Programmes, urban/rural differences, RCH, Demography and Family Welfare.
15. Do orientation of the inter-linkage of health sector and non-health sector for promotion of Health & control and prevention of diseases.
16. Have familiarity with administrative procedures and protocols
17. Have knowledge about role of media and its use in health.

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18. Have knowledge of Health Care Administration, Health Management and Public Health Leadership
19. To describe Health Policy planning, Medical Education technology, Information Technology and integration of alternative Health system including AYUSH.
20. To describe the intricacies of Social & Behavioral sciences and their applications.
21. To describe Public Health Legislations
22. To understand and describe International Health & Global Diseases surveillance.
23. To relate the history of symptoms with specific occupation, diagnostic criteria, preventive measures, identification of various hazards in a specific occupational environment and legislations.
24. To keep abreast of recent advances in Public Health & formulate feasible, optimal, sustainable, cost effective strategies in response to the advances in public health & development.
25. To describe the principles of Health Economics and apply it in various public health settings.
26. To explain and correlate common health problems (medical, social, environmental, economic, psychological) of urban slum dwellers, organization of health services in urban slum areas
27. Develop workable interventions for control and prevention of emerging and re-emerging diseases at local, national and global level.
28. Identify behavior pattern of individual or group of individuals detrimental or adversely affecting their health
29. Define and identify vulnerable, under-privileged high risk communities and their special needs
30. To create awareness about various public health laws
31. Evaluate cost effectiveness and cost benefits of a Health Program
32. Understand and express implications of 'Poverty Line', 'Social Inclusion', 'Equity', 'taxations', 'Insurance' on Health care management.
33. To categorize hospital waste and be able to guide for proper disposal.
34. To provide a comprehensive plan for disaster management and mitigation of sufferings.

B. Affective domain:

1. Should be able to function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the patient and the clinician or other colleagues to provide the best possible diagnosis or opinion.
2. Always adopt ethical principles and maintain proper etiquette in dealings with patients, relatives and other health personnel and to respect the rights of the patient including the right to information and second opinion.
3. Develop communication skills to word reports and professional opinion as well as to interact with patients, relatives, peers and paramedical staff, and for effective teaching.

A. C. Psychomotor domain: ((The student should be able to:)

The student should be able to perform independently the following :

- Conduct community surveys for assessment of health & morbidity profile, epidemiological determinants, assessment of health needs, disease surveillance, evaluation of health programmes and community diagnosis
- Conduct epidemic investigations, spot maps, predict disease trends, preparation of reports, planning and implementation of control measures
- Demonstrate clinical skills of preparing case history, examination, provisional diagnosis, treatment and clinical case management and interpretation of laboratory findings. Conduct common procedures such as incision, drainage, dressings & injections.
- Do data collection, compilation, tabular and graphical presentation, analysis and interpretation, applying appropriate statistical tests, using computer-based software application for validation of findings
- Conduct epidemiological research studies to establish cause-effect relationships in elaborating the epidemiology of diseases and health events
- Develop appropriate IEC Material, assessment of community communication needs, training skills, counseling skills, conduct Health Education Programmes in urban and rural settings
- Conduct dietary surveys, assessment of nutritional status, nutritive values of common food menus, detection of food adulterants, use of lactometer, recording and interpretation of growth and development charts.
- Use and apply various instruments and processes concerned with environmental health and biological waste management eg. waste collection, segregation and disposal as per protocols, needle-disposers, disinfection procedures. Also use of Dosi-meters, Kata / Globe Thermometer, Slings Psychrometer, Gobar Gas Plant, Soakage pit, Solar Energy, functioning of ILRs, Deep Freezers, Cold Boxes, Vaccine Carriers.
- identify different types of mosquitoes, detect vector breeding places and orientation of the methods of elimination of breeding places and placement of a mosquito-proof water tank.
- Conduct clinical screening of various diseases and organize community health camps involving community participation in urban and rural settings. Use of Snellen charts for vision, Ischiara's chart for colour blindness, tourniquet tests for dengue diagnosis in fever, BMI and other physical measurements of infants, children and adults etc., copper-T insertions and preparation of pap smear.
- Conduct tests for assessment of chlorine demand of water (Horrock's Apparatus), procedure of well-water and urban water-tank chlorination, assessment of chlorination levels, physical examination of water, methods domestic water purification, oriented in use of water filters.
- Prepare health project proposals with budgeting based on the project objectives.

Miscellaneous skills: (The student should be able to)

1. Devise appropriate health education messages for public health awareness using various health communications strategies.

2. Identify family level and community level interventions and facilitate the implementation of the same e.g. food hygiene, food storage, cooking demonstrations, community kitchen, kitchen garden, empowerment of women for promoting nutritional health etc.
3. Demonstrate counselling skills for family planning services.
4. Plan and execute BCC strategy for individuals.
5. Conduct measurement of occupational exposure to harmful influences.
6. Diagnose occupational hazards and undertake surveys to identify occupational exposures as and when necessary.
7. Elicit appropriate response at individual and community level to prevent occupational hazards including IEC activities at different levels.
8. Use modern IT applications especially internet & internet-based applications.

Syllabus

Course contents:

1. Conceptual (and applied) understanding of Public Health, Community Medicine, clinical disease-oriented approach, Preventive approach & Health promotion, disease control & promotion.

Learning objectives:

At the end of this course topic, the student should be able to:-

i. Understand and explain the concept & application and give suitable analogies/examples related to Public Health/Community Medicine (with differences), Disease-oriented v/s Preventive approach, health promotion disease control & prevention.
ii. Explain correlation between health and human development with analogies/ examples.
iii. Explain concept of Primordial, Primary, Secondary and Tertiary prevention with examples.
v. Evolutionary History and mile-stones in Public Health – National and International levels.

2. Communicable and Non-Communicable diseases, emerging and re-emerging diseases

Learning objectives:

At the end of this course, the student should be able to:-

i. Understand and explain Epidemiology of Communicable/Non-communicable diseases- its causes, precipitating factors, social & other non- health causes, mechanisms of transmission, signs/systems, management, control & prevention measures, related national Health Programmes & national Guidelines, Directives, special projects, if any.
ii. Explain application of Disease surveillance system in control of Communicable/Non-communicable diseases.
iii. Explain & undertake steps to investigate & control outbreaks, epidemics and take measures to prevent the same.
iv. Evolve prevention & control measures based on local & regional epidemiological funding, synchronizing with National guidelines.

3. Applied Epidemiology, Health research, Bio-statistics

Learning objectives:

At the end of this course, the student should be able to:-

i. Explain the concept & application of Epidemiology of Disease and Health giving suitable examples.

ii. Explain Epidemiological approach, the terms Distribution & Determinants, uses, types of Epidemiological studies, interpretation, merits/demerits and limitations, odds ratio, relative risk, attributable & population attributable risks, Hybrid designs (with examples), validity of Epidemiological Data and application in practice at field level.

iii. Explain Epidemiological Research methods, Research related protocols, Literature review, estimating sample size, data collection/ compilation/Analysis/ Research, interpretation.

iv. Develop Health interventional programs based on Epidemiological Finding & create evidence for Public Health action.

v. Understand difference between data, information & intelligence, types of data, survey methods, formulating questionnaires, interview schedule, data presentation types & analysis.

vi. Apply computer based software application for data designing, data management & collation analysis e.g. SPSS, Epi-info, MS office and other advanced versions.

4. Nutrition

Learning objectives:

At the end of this course, the student should be able to:-

i. Identify various nutritional problems in the region, state and country and contributing factors for the same, with due emphasis on ecology perspectives.

ii. Explain importance of various nutrients (including micronutrients) in health, their sources, requirements and problems associated with their deficiencies as well as over consumption.

iii. Plan balanced diet and dietary requirements of various age and sex groups.

iv. Dietary/nutritional concerns of vulnerable groups – young children, adolescents, ANC/PNC/Lactating mothers/senior citizens/individuals with various health problems e.g hypertension, diabetes, renal problems etc.

v. Classification of food, food additives, food fortification, food enrichment, food toxins and food adulteration.

vi. Explain Food production, Food hygiene and safety, food storage, food preparation, food wastage and feeding practices.

vii. Assessment of nutritional status of a community by adopting different methodologies.

viii. Nutritional supplementation, surveillance, education and rehabilitation.

ix. National programmes in nutrition and their evaluation

x. National nutrition policy.

5. Environmental health

Learning objectives:

At the end of this course, the student should be able to:-

i. Highlight importance of external environment (air, water, noise, radiation, temperature, ventilation, solid waste disposal, insects and vectors, domestic and country yard pests, industrial waste disposal etc. and its impact on ecology and human health.
ii. Elaborate on health issues related to housing, air, water, noise, radiation pollution i.e. size of problems, area and specific groups affected, measurement of pollution levels and health impact of the same, corrective measures
iii. Elaborate on requirements of water, water chlorination and household purification measures, measurement of chlorine demand, Break-point chlorination levels, water quality.
iv. Assessment of quality of water and air, control of air pollution
v. Explain environmental sanitation and control measures (including appropriate technologies) – modern methods of sewage disposal, mechanical ventilation, soakage pits, gobar gas plants, smokeless Chula, solar energy, rainwater harvesting, sewage water recycling plants at society level etc.
vi. Explain global warming and its health impact.
vii. Elaborate on forest reserves, social forestry and health
viii. Study vectors of medical importance and integrated control measures against them.
ix. Explain dynamics of transmission of vector borne diseases
x. Explain pest control measures
xi. Explain environmental health issues in urban and rural areas
xii. Understand functioning of public sector measures to safeguard environmental health e.g water purification plant
xiii. Explain Legislative measures for protection of environmental health

6. Primary Health Care System, Panchayat Raj, National Health Programmes including RCH, Demography & Family Welfare:

Learning Objectives

At the end of this course, the student should be able to:-

i. Explain the meaning of Primary Health Care with suitable analogies with reference to India, and be able to define the systems approach for implementation of Primary Health Care.
ii. Enumerate the elements, principles, population coverage norms, staff patterns, day to day activities, programme schedule, stakeholders at PHC level.
iii. Explain the scope and implications of 3-tier system of Primary Health Care.
iv. Understand functioning of Rural Panchayat Raj system of development and its co-relation with health.
v. Promote community participation in Primary Health Care programme and motivate various stakeholders for the same.
vi. Understand and comply with medico-legal procedures related to Primary Health Care activities.
vii. Integrate, coordinate both health and non-health sectors for implementing various national health programmes.

viii. Deliver the provisions of various health schemes to eligible be beneficiaries such as Janani Suraksha Yojana, Rashtriya Swasthya Beema Yojana, Rajiv Gandhi Jeevandayi Arogya Yojana etc.

ix. Impart training in health programmes for paramedical workers, lab technicians, community health volunteer's, interns and provide health education in the community.

x. Implement Public Health Skills for investigations and containment of outbreaks & epidemics.

xi. Understand history of evolution of public health, important milestones in the world and in India.

xii. Enumerate the various health committees established and their major recommendations since 1947-48 to till date.

7. Health Care Administration, Health Management and Public Health Leadership

Learning Objectives:

At the end of this course, the student should be able to:-

i. Explain the conceptual difference between Administration and Management, Power and Authority with reference to health care.

ii. Explain the role of fundamental principles of constitution, principles of Democracy and its correlation with health care administration.

iii. Explain the role of Bureaucracy, Technocracy, Political system, Judiciary, Media and people in health care administration.

iv. Explain and identify the key positions and their role in health administration at State, District, Taluka (Tehsil block) and village level.

v. Explain the frame work of health care system at State, District, Taluka & village level and understand the mechanism of coordination between bureaucrats, technocrats, political, judiciary and media at each of these levels.

vi. Enumerate functions of a manager, explain concepts of management and leadership styles, various management techniques, planning process, monitoring & evaluation skills.

vii. Should be sensitive to quality issues in health care management and comply with relevant quality management techniques.

viii. Formulate and manage team approach for implementing health programmes.

ix. Apply skills of effective human resource management and identify relevant roles, responsibilities and duties of functionaries.

x. Implement skills of motivation, communication, negotiation and conflict management at PHC level.

xi. Develop budgetary statements based on evidence of needs assessment and be able to maintain account of expenditure as per norms.

xii. Undertake community health needs survey, conduct training & communication needs assessment of paramedical and health workers, identify vulnerable, underprivileged communities, implements high risk approach.

8. Health Policy, Medical Education, Integrating Alternative system of Medicine

Learning Objectives

At the end of this course, the student should be able to:-

i. Understand and elaborate implications of the policy provision with reference to the current health scenario in the country.
ii. Explain the role of health policy in promotion of Primary Health care, ensuring equity, inter-sectoral co-ordination, appropriate technology and community participation.
iii. Explain the various provisions for promotion of preventive and curative health services including National Health Mission, National Health Programs, Quality Hospital based services, Medical Education and AYUSH.
iv. Critically appreciate merits and demerits of the Health Policy.
v. Explain SWOT analysis of the policy and debate on evidence based recommendations, additions, deletions.
vi. Debate on suggestions or recommendations for future inclusions.

9. Social and behavioral sciences

Learning objectives:

At the end of this course, the student should be able to:-

i. Understand influence of social and behavioral practices on health.
ii. Understand principles of behavior change of an individual and community. Clearly understand difference between knowledge, attitude and practices..
iii. Understand importance of social medicine and health.
iv. Importance of behavior change communication (BCC).
v. Socio-cultural factors influencing behavior change.
vi. Formal and informal organizations in the community.
vii. Influence of peer pressure.
viii. Know the health problems, where BCC interventions are necessary.
ix. Understand factors promoting and detrimental to BCC.

11. Public Health Legislations

Learning objectives:

At the end of this course, the student should be able to:-

i. Explain public health legislations and need for the same.
ii. Know in detail each public health law – when, why, implementation, impact, issues etc.
iii. Enforcement of various public health laws.
iv. Judiciary mechanism for ensuring proper implementation of public health laws.
v. Scope for integrated approach for implementation of public health laws.

12. International Health

Learning Objectives:

At the end of this course, the student should be able to:-

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i. Understand the need and scope for international health measures.
ii. Enlist and understand functioning of various UN agencies (including WHO) playing key role in international health.
iii. Enlist and understand functioning of bilateral vs multilateral international donor agencies.
iv. Provide advice to international travelers and vaccination requirements,
v. Understand International health control measures e.g. quarantine, airport management etc.
vi. Understand the management of international ports from health perspectives.

13. Occupational Health

Learning Objectives:

At the end of this course, the student should be able to:-

i. Understand the concept of occupational health and its importance, Occupational environment and work dynamics.
ii. Know different types of occupational exposures at various settings.
iii. Enlist various occupational hazards and their relative magnitude.
iv. Understand measurement of exposure levels to harmful influences during occupation.
v. Understand preventive and control measures against various occupational hazards – global, national and local level measures.
vi. Understand individual and community responses towards preventing exposure to occupational hazards.
vii. Understand and advise occupational safety measures.
viii. Understand legislative measures to prevent exposures to occupational hazards.
ix. Advise compensation provisions to persons exposed to various occupational hazards.
x. Understand occupational health problems amongst people in unorganized sector
xi. Understand and advise social security and welfare provisions for workers – ESIS, Factory's Act, Role of ILO, Ministry of Labor, DGFASLI.

14. The recent advances in Public Health & miscellaneous issues

Learning Objectives:

At the end of this course, the student should be able to:-

i. identify & enlist events at local, district, national & global levels influencing or adversely affecting health /medical issues of the population.
ii. Adopt & practise skills related to utilization of modern technology, software, IT application in the interest of health promotion & disease prevention.

15. Health Economics

Learning Objectives:

At the end of this course, the student should be able to: -

i. Describe the scope of health economics.

ii. Understand health market & its characteristics.
iii. Understand & apply economic evaluation techniques.
iv. Assess the mechanism of Funding Health Care services, especially health insurance.
v. Advise on alocation of resources appropriately in their work area.

TEACHING AND LEARNING METHODS

Teaching methodology

The following is a rough guideline to various teaching/learning activities that may be employed:

- **Journal Club :** Critical appreciation and discussion of research articles in indexed journals
- **Seminar**
- **Lecture/Discussion :** Lectures on newer topics by faculty
- **Case presentation :** Communicable disease case presentation (focus on epidemiology, control, prevention) or Family case (focus on health needs assessment, SWOT analysis of family, social determinants and social empowerment, community management, role of primary health care and mobilizing resources for empowerment of the family). PG students will present the cases in presence faculty and discuss various modalities of management.
- **Public Health Management training** in Immunization clinics, Disease Surveillance Units, General Preventive OPD, hands-on training in management of national health programs at urban health centre and rural health centre along with orientation in health administrative system.
- The PG student shall be required to participate in the teaching and training programme of Undergraduate students and interns.
- The PG student must have attended Mandatory training in Research Methodology during his tenure.
- A postgraduate student of a postgraduate degree course in broad specialities/super specialities would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.
- Special Seminars / Workshops: conducted by External Faculty on cross-cutting subjects directly or indirectly concerned with Health. eg. Critical appreciation of National Developmental Budget, delivered by prominent Economist.
- **Log Book:** Postgraduate students shall maintain a log book of the work carried out by them and the training programme undergone during the period of training including details of work experience during their postings, including programs implemented under supervision and those performed independently. The log book shall be checked and assessed periodically by the faculty members imparting the training.
- Department should encourage e-learning activities.
- **Postings are given below:**

Recommended schedule for three years training:

Orientation Training/Field postings
for students of MD Community Medicine

No.	Field Posting and work	Duration
01	Posting at Sub-centers & PHCs Under & at RHTC and UHTC attached to Dept of Community Medicine as per MCI norm	Total period of ONE year during the 3 year period of PG course. Posting at RHTC should be residential.
02	Posting in the teaching hospital for exposure to clinical departments namely Pediatrics, OBGY & General medicine to acquire clinical skills for diagnosis and management of Communicable and Non-Communicable Diseases	Total - One month General Medicine-2 wks Pediatrics -1 wk Ob. & Gy. -1 wk Time of posting shall be at the discretion of local feasibility
03	Work attachment to gain hands- on skills based, training in public health department & orientation in Health Administration and Management of various National Health Programmes and aspects of public health management at the offices of the DHO/DHS/THO/DTO/DMO/CDPO/MOH of Local Civic Body or district health authorities.	Total - One month Place & time of 2 postings of 2 wks each shall be at discretion of local feasibility.
04	Short duration posting in various camps, melas, public health emergencies, investigation of epidemics, implementation of NHP, linen dept of hospital, Hospital kitchen, Hospital record section, central drug store, Medical Supdt. Office, blood bank, casualty dept., CCL, Hospital waste management, ART-VCTC, Matron Office (HRD), HMIS etc.	Total - one month Minimum of four postings of 1wk duration each shall be done subject to local feasibility.
05	Visits to various institutions of Public Health Importance	Subject to local feasibility

During the training programme, patient safety is of paramount importance; therefore, skills are to be learnt initially on the models, later to be performed under supervision followed by performing independently; for this purpose, provision of skills laboratories in medical colleges is mandatory.

ASSESSMENT

FORMATIVE ASSESSMENT, ie., during the training may be as follows:

Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self directed learning and ability to practice in the system.

Quarterly assessment during the MD training should be based on:

1. Journal based / recent advances learning

2. **Patient based /Laboratory or Skill based learning**
3. **Self directed learning and teaching**
4. **Departmental and interdepartmental learning activity**
5. **External and Outreach Activities / CMEs**

The student to be assessed periodically as per categories listed in postgraduate student appraisal form (Annexure I).

SUMMATIVE ASSESSMENT, ie., at the end of training

The summative examination would be carried out as per the Rules given in POSTGRADUATE MEDICAL EDUCATION REGULATIONS, 2000.

The examination shall be in three parts:

1. **Thesis**

   Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination. The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination. A post graduate student shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners.

2. **Theory Examination:**

The Post Graduate examination shall be in three parts: -

1. **Thesis:** It should be submitted to the University by each post graduate student at least 6 months before the theory and clinical/practical examination. The thesis shall be examined by a minimum of three examiners, one internal and two external examiners, appointed by the university and who shall not be the examiners for theory and practical. A post graduate student shall be allowed to appear for the theory and practical/clinical examination only after the acceptance of the thesis by two examiners.

2. **Theory**:

   The examinations shall be organised on the basis of 'Grading'or 'Marking system' to evaluate and to certify post graduate student 's level of knowledge, skill and competence at the end of the training. Obtaining a minimum of 50% marks in 'Theory' as well as 'Practical' separately shall be mandatory for passing examination as a whole. The examination for M.D./ MS shall be held at the end of 3rd academic year. An academic term shall mean six month's training period**.**

   There shall be four theory papers as follows:

   Paper I : Conceptual (and applied) understanding of Public Health, Community Medicine, Communicable and Non- Communicable diseases, emerging and re-emerging diseases, Applied Epidemiology, Health research, Bio-statistics.

Paper II: Nutrition, Environmental Health, Primary Health Care system, Panchayat Raj system, National health Programs, RCH, Demography and Family Welfare, Health Care Administration, Health Management and Public Health Leadership.

Paper III: Social & Behavioral sciences- applied aspects, Scientific communications & Medical writing, Research Methodology, Public Health Legislations, International Health & Global Diseases surveillance.

Paper IV: Health Policy planning, Medical Education technology, Information Technology, Integration of alternative Health system including AYUSH, Occupational Health, Recent advances in Public Health & Miscellaneous issues, Health Economics.

Practical/Clinical and oral examination:

The practical examination should be conducted over two days, not more than 8 post graduate students per batch, per day as follows :

1. **One long Family case from the community**:

   Socio-economic, demographic, cultural and holistic history taking, of the family to understand the various risk factors affecting health and quality of life, assessment of social support system, assessment of present morbidity and its implications, evolve interventions for medical relief and social empowerment and role of family, community and primary health care system in resolving family issues. This shall be conducted preferably in the community setting.

2. **One long Case (30 minutes), 2 short cases (20 minutes each) – Cases with Communicable Diseases**

   Students will elaborate on clinico-epidemiological case history to assess the epidemiological factors, precipitating factors, probable source of infection and evolve measures for diagnosis, treatment, management with reference to the case as well as major public health concerns, i.e. Control, prevention of the diagnosed disease and interventions in case of eminent outbreak / epidemic situations. Short cases may be assessed without presentation of detailed history, beginning with Differential Diagnosis in the given time.

3. **Epidemiology and Statistics problem-solving exercises (5):**
   (Epidemiological – 3, Statistical – 2)

4. **Public Health Spots (5) :** including interpretation of analytical reports of water, food, environmental assessment and public health micro-biology

5. **Viva-voce Examination**

   Oral/ Viva-Voce Examination shall be comprehensive enough to test the post graduate student's overall knowledge of the subject.

Recommended reading:

A. Books (latest edition)

1. *Public Health and Preventive Medicine* (Maxcy-Rosenau-Last Public Health and Preventive Medicine) by Robert B. Wallace
2. *Basic Epidemiology*. R Bonita, R Beaglehole, T Kjellstrom. World Health Organization Geneva.
3. *Epidemiology,* by Leon Gordis.
4. *Oxford Textbook of Public Health.* Holland W, Detel R, Know G.
5. *Practical Epidemiology*, by D.J.P Barker
6. *Park's Textbook of Preventive and Social Medicine*, by K.Park
7. *Principles of Medical Statistics,* by A. Bradford Hill
8. *Interpretation and Uses of Medical Statistics,* by Leslie E Daly, Geoffrey J Bourke, James MC Gilvray.
9. *Epidemiology, Principles and Methods*, by B. MacMahon, D. Trichopoulos
10. *Hunter's Diseases of Occupations*, by Donald Hunter, PAB Raffle, PH Adams, Peter J. Baxter, WR Lee.
11. *Epidemiology and Management for Health Care,*, by Sathe PV and Doke PP.
12. *Vaccines*, by Stanley A. Plotkin.
13. All reports and documents related to all National Programmes from the Ministry of Health and Family Welfare.

B. Journals

03-05 international Journals and 02 national (all indexed) journals

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Annexure I

Postgraduate Students Appraisal Form

Pre / Para /Clinical Disciplines

Name of the Department/Unit :

Name of the PG Student :

Period of Training : FROM.....TO.....

Sr. No.	PARTICULARS	Not Satisfactory	Satisfactory	More Than Satisfactory	Remarks
		1 2 3	4 5 6	7 8 9	
1.	Journal based / recent advances learning				
2.	Patient based /Laboratory or Skill based learning				
3.	Self directed learning and teaching				
4.	Departmental and interdepartmental learning activity				
5.	External and Outreach Activities / CMEs				
6.	Thesis / Research work				
7.	Log Book Maintenance				

Publications **Yes/ No**

Remarks*_____

_____

_____

***REMARKS: Any significant positive or negative attributes of a postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.**

SIGNATURE OF ASSESSEE **SIGNATURE OF CONSULTANT** **SIGNATURE OF HOD**

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COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR MD IN DERMATOLOGY, VENEREOLOGY & LEPROSY

Preamble:

The purpose of PG education is to create specialists who would provide high quality health care and advance the cause of science through research & training.

A post graduate specialist having undergone the required training should be able to recognize the health needs of community, should be competent to handle effectively the medical problems and aware of recent advances pertaining to the discipline. The PG student should acquire basic skills in teaching medical/para-medical students. The student should be able to counsel patients and relatives in infectious diseases like HIV/AIDS, STDs, cutaneous tuberculosis, leprosy and any event of serious illness or death.

The purpose of this document is to provide teachers and learners illustrative guidelines to achieve defined outcomes through learning and assessment. This document was prepared by various subject-content specialists. The Reconciliation Board of the Academic Committee has attempted to render uniformity without compromise to purpose and content of the document. Compromise in purity of syntax has been made in order to preserve the purpose and content. This has necessitated retention of “domains of learning” under the heading “competencies”.

SUBJECT SPECIFIC OBJECTIVES

At the end of 3 years of post graduate training in Dermatology, Venereology & Leprosy:

- Student should have knowledge of basic sciences (Anatomy, Physiology, Biochemistry, Microbiology, Pathology and Pharmacology) as applied to dermatology. The student should acquire in-depth knowledge of his subject including recent advances. The student should be fully conversant with the bedside procedures (diagnostic and therapeutic) and having knowledge of latest diagnostics and therapeutics available.
- Student should have acquired practical and procedural skills related to the subject.
- Critically evaluate, initiate investigation and clinically manage cases in Dermatology, Venereology and Leprosy with the help of relevant investigations.

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- Should plan and advise measures for the prevention and rehabilitation of patients with various dermatological conditions.
- Able to ensure the implementation of National Health Programmes, particularly in sexually transmitted diseases (STD) and leprosy.
- Acquire training skills in research methodology, professionalism, attitude and communication skills, as below:
    - Student must know basic concepts of research methodology, plan a research project, consult library and online resources, has basic knowledge of statistics and can evaluate published studies.
    - Should be able to practice the specialty of dermatology ethically.
    - Recognize the health needs of patients and carry out professional obligations in keeping with principles of National Health Policy and professional ethics.
- Teaching skills in the subject
    - Student should learn the basic methodology of teaching and develop competence in teaching medical/paramedical students.
- Should have acquired Problem Solving skills

SUBJECT SPECIFIC COMPETENCIES

By the end of the course, the student should have acquired knowledge (cognitive domain), professionalism (affective domain) and skills (psychomotor domain) as given below:

A. Cognitive domain

At the end of the course, the student should have acquired following theoretical competencies:

- Describe structure, functions and development of human skin.
- Describe ultrastructural aspects of epidermis, epidermal appendages, dermo-epidermal junction, dermis, and sub-cutis.
- Describe basic pathologic patterns and reactions of skin.
- Demonstrate the knowledge of common laboratory stains and procedures used in the histopathologic diagnosis of skin diseases and special techniques such as immunofluorescence, immunoperoxidase and other related techniques.
- Describe the basics of cutaneous bacteriology, mycology, virology, parasitology and host resistance.
- Describe papulosqamous and vesiculobullous disorders.
- Describe disorders of epidermal appendages and related disorders.
- Describe inflammatory and neoplastic disorders of dermis.
- Describe skin lesions in nutritional, metabolic and heritable disorders.

- Describe pharmacokinetics and principles of topical and systemic therapy.
- Describe drug reaction, its diagnosis and management.
- Describe cutaneous manifestations of systemic disorders.
- Describe anatomy of male and female genitalia, epidemiological transmission, clinical aspects and management of STDs and HIV.
- Describe clinical features, reactions, treatment and rehabilitation in leprosy.
- Describe etiology, pathophysiology, principles of diagnosis and management of common problems in dermatology including emergencies in adults and children.
- Describe indications and methods for fluid and electrolyte replacement therapy including blood transfusion in dermatological conditions.
- Describe common dermatological malignancies in the country and their management including prevention.
- Should be expert in evaluation of ECG, chest X-ray (CXR), biochemical, haematology and immunology reports related to dermatology.
- Acquire knowledge of common laboratory stains and procedures used in the histopathologic diagnosis of skin diseases and special techniques such as immuno-fluorescence, immuno-peroxidase and other related techniques.
- Acquire knowledge of the basics of laser operation and precautions which needs to be taken.
- Demonstrate competence in basic concepts of research methodology and interpretation of data in medical literature/publications.
- Skilled as a self-directed learner, recognize continuing educational needs; use appropriate learning resources and critically analyze relevant published literature in order to practice evidence-based dermatology;
- Should also have a broad idea how to approach an uncommon dermatological disease.

B. Affective Domain

At the end of the course, the student should have acquired the following attitudinal competencies:

- Demonstrate self-awareness and personal development in routine conduct.
- **Behavior and Emotional Stability:** Dependable, disciplined, dedicated, stable in emergency situations and shows positive approach.
- **Motivation and Initiative:** Is innovative, enterprising,does not shirk duties or leave any work pending and motivates team members.
- **Honesty and Integrity:** Is truthful, admits mistakes, does not cook up information, has ethical conduct and exhibits good moral values.
- **Interpersonal Skills and Leadership Quality:** Has compassionate attitude towards patients and attendants, gets on well with colleagues and paramedical staff, is respectful to seniors, has good communication skills.

- Should be able to maintain confidentiality with regards to history, physical examination and management of patients.
- Identify social, economic, environmental, biological and emotional determinants of patients, and institute diagnostic, therapeutic, rehabilitative, preventive and promotive measures to provide holistic care to patients at individual and community level against skin, venereal disease and leprosy.
- Recognize the emotional and behavioral characteristics of patients and keep these fundamental attributes in focus while dealing with them.
- Demonstrate empathy and humane approach towards patients and their families and respect their sensibilities.
- Demonstrate communication skills of a high order in explaining management and prognosis, providing counseling and giving health education messages to patients, families and communities.
- Organize and supervise the desired managerial and leadership skills.
- Should be able to function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the patient and the clinician or other colleagues to provide the best possible diagnosis or opinion.
- Always adopt ethical principles and maintain proper etiquette in dealings with patients, relatives and other health personnel and to respect the rights of the patient including the right to information and second opinion.

C. Psychomotor Domain

A student at the end of training of 3 years of MD programme, must acquire the following practical skills:

- General medical skills as learnt in MBBS to be maintained:
    - Should be able to provide basic life support (BLS).
    - Should be expert in blood pressure measurement, intravenous access, blood sampling, fluid electrolytes therapy, plerual and cerebrospinal; fluid (CSF) fluid examination.
    - Should be able to provide basic and advanced life-saving support services in emergency situations.
    - Should be able to undertake complete monitoring of the patient and identify social, economic, environmental and emotional determinants in a given case and take them into account for planning therapeutic measures.
- Recognize conditions that may be outside the area of his specialty/competence and refer them to the proper specialist.

Dermatology, Venereology and Leprosy, HIV/AIDS Skills

The student should:

- Acquire skills in history taking, physical examination, diagnosis and management of patients in dermatology, venereology and leprosy.
- Be able to identify, classify and differentiate cutaneous findings in dermatological terms in a systematic way.
- Be able to perform systemic examination (chest, cardiac, abdomen, neurological, genitals, oral, eye and gynaecological examination) relevant to dermatologic condition.
- Be competent to manage dermatologic emergencies like angioedema, toxic epidernmal necrolysis (TEN), Stevens-Johnson syndrome (SJS), pemphigus, drug reaction and necrotic erythema nodosum leprosum (ENL).
- Be able to plan and deliver comprehensive treatment for diseases using principles of rational drug therapy.
- Be able to plan and advice measures for the prevention of infectious disease.
- Be able to plan rehabilitation of patient suffering from chronic illness and disability and those with special needs like leprosy.
- Demonstrate skills in documentation of case details and of morbidity/mortality data relevant to the assigned situation.

Laboratory Skills

The student:

- Should be able to perform common laboratory procedures like potassium hydroxide (KOH) mount, Gram stain, Giemsa stain, acid fast bacilli (AFB) stain, Woods lamp examination, stains,culture media etc. related to the cutaneous diagnosis independently.
- Should be able to order relevant investigations and interpret them to reach to a diagnosis.
- Should be familiar with other recent investigations.

Dermatopathology - Student should be competent enough to:

- To interpret histopathology of common skin diseases.
- To diagnose common skin diseases by examining slides under microscope.

Surgery in dermatology

At the end of training following skills should be performed independently by the student:

1. Should able to give incisions, take stitches and sutures.
2. Should be trained in taking skin biopsy and nail biopsy.
3. Should be able to perform chemical peels, manual dermabrasion, skin punch grafting and wound dressing independently.

4. Should be able to perform cryosurgery, nail surgery and acne surgery.
5. Able to perform chemical cauterization, cryotherapy, patch and photopatch test, slit smears and tissue smears.

Venereology

1. Should be competent in the clinical approach to the patient of STDs and HIV/AIDS.
2. Should be able to interpret the histopathological diagnosis including laboratory aids related with venereology.
3. Able to perform dark ground illumination, gram stain, Bubo aspiration and tissue smear.
4. Able to manage the patient according to syndromic approach for treatment of STDs.

Leprosy

The student should be:

1. Able to diagnose and approach the case of leprosy.
2. Perform AFB smear.
3. Able to manage cases of lepra reaction.
4. Identify, judge and decide when to refer the patients at appropriate level for surgery or rehabilitation.Should able to manage pediatric cases with skin diseases.

Syllabus

Course contents

Topics related to allied basic sciences

- The structure, functions and development of human skin.
- Ultrastructural aspects of epidermis, epidermal appendages, dermo-epidermal junction, dermis, and sub-cutis.
- Immunology, molecular biology and genetics in relation to the skin.
- Epidermal cell kinetics and keratinization.
- Lipids of epidermis and sebaceous glands.
- Percutaneous absorption.
- Skin as an organ of protection and thermoregulation.
- Biology of eccrine and apocrine sweat glands.
- Biology of melanocytes and melanin formation.
- Biology of hair follicles, sebaceous glands and nails.
- Epidermal proteins.
- Dermal connective tissue: collagen, elastin, reticulin, basement membrane and ground substance.
- Metabolism of carbohydrates, proteins, fats and steroids by the skin.
- Cutaneous vasculature and vascular reactions.

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- Mechanism of cutaneous wound healing.
- Cellular and molecular biology of cutaneous inflammation and arachidonic acid metabolism.
- Immunologic aspects of epidermis.
- Human leukocyte antigen (HLA) system.
- Immunoglobulins.
- Cytokines and chemokines.
- Lymphocytes, neutrophils, eosinophils, basophils and mast cells.
- Complement system.
- Hypersensitivity and allergy.
- Cutaneous carcinogenesis (chemical, viral and radiation).
- Basics of cutaneous bacteriology, mycology, virology, parasitology and host resistance.
- Common laboratory procedures, stains,culture media etc. related to the cutaneous diagnosis.
- Basic pathologic patterns and reactions of skin.
- Common laboratory stains and procedures used in the histopathologic diagnosis of skin diseases and special techniques such as immunofluorescence, immunoperoxidase and other related techniques**.**

Clinical dermatology

- Epidemiology of cutaneous disease.
- Psychologic aspects of skin disease and psycho-cutaneous disorders.
- Pathophysiology and clinical aspects of pruritus.

Papulosquamous diseases

- Psoriasis, pityriasis rubra pilaris, pityriasis rosea.
- Parapsoriasis, lichen planus, lichen niditus.
- Palmo-plantar keratodermas, Darier’s disease, porokeratosis.
- Ichthyoses and ichthyosiform dermatoses.
- Kyrle’s disease and other perforating disorders.

Vesiculo - bullous disorders

- Erythema multiforme, Stevens-Johnson syndrome, Toxic epidermal necrolysis.
- Bullous pemphigoid, Pemphigus.
- Chronic bullous disease of childhood.
- Herpes gestationis (pemphigoid gestationis).
- Hereditary epidermolysis bullosa.
- Epidermolysis bullosa acquisita.
- Dermatitis herpetiformis.
- Familial benign pemphigus.

- Subcorneal pustular dermatoses.
- Pustular eruptions of palms and soles.

Disorders of epidermal appendages and related disorders

- Disorders of hair and nails.
- Disorders of sebaceous glands.
- Rosacea, Perioral dermatitis, acne.
- Disorders of eccrine and apocrine sweat glands.
- Follicular syndromes with inflammation and atrophy.

Epidermal and appendageal tumours

- Precancerous lesions, squamous cell carcinoma and basal cell carcinoma
- Keratoacanthoma, benign epithelial tumours, appendageal tumours
- Merkel cell carcinoma, Paget's disease

Disorders of melanocytes

- Disorders of pigmentation, albinism, benign neoplasia and hyperplasias of melanocytes, dysplastic melanocytic nevi, cutaneous malignant melanoma.

Inflammatory and neoplastic disorders of the dermis

- Acute febrile neutrophilic dermatosis (Sweet's syndrome)
- Erythema elevatum diutinum
- Cutaneous eosinophilic diseases
- Granuloma faciale
- Pyoderma grangrenosum
- Erythema annulare centrifugum and other figurate erythemas
- Granuloma annulare
- Malignant atrophic papulosis (Dego's Disease)
- Neoplasms, pseudoneoplasms and hyperplasias of the dermis
- Vascular anomalies
- Kaposi's Sarcoma
- Anetoderma and other atrophic disorders of the skin
- Ainhum and pseudoainhum
- Neoplasias and hyperplasias of neural and muscular origin
- Elastosis perforans serpiginosa and reactive perforating collagenosis

Lmphomas, pseudolymphomas and related conditions

Disorders of subcutaneous tissue

- Panniculitis

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- Lipodystrophy
- Neoplasms of the subcutaneous fat

Disorders of the mucocutaneous integument

- Biology and disorders of the oral mucosa
- Disorders of the anogenitalia of males and females

Cutaneous changes in disorders of altered reactivity

- Genetic immunodeficiency diseases
- Urticaria and Angioedema
- Disorders associated with complement abnormalities
- Graft-versus-host Disease
- Muco-cutaneous manifestations in immunosuppressed host other than HIV-infection
- Contact dermatitis
- Auto-sensitization dermatitis
- Atopic dermatitis (atopic eczema)
- Nummular eczematous dermatitis
- Seborrhoeic dermatitis
- Vesicular palmoplantar eczema

Skin changes due to mechanical and physical factors

- Occupational skin disease
- Radiobiology of the skin
- Skin problems in amputee
- Sports dermatology
- Skin problems in war field
- Decubitus ulcers

Photomedicine, photobiology and photo immunology in relation to skin

- Acute and chronic effects of ultraviolet radiation and sun light on the skin
- Narrow-band ultraviolet B (NBUVB) therapy, phototherapy, photochemotherapy

Disorders due to drugs and chemical agents

- Cutaneous reactions to drugs
- Mucocutaneous complications of anti-neoplastic therapy
- Cutaneous manifestations of drug abuse

Dermatology and the ages of man

- Neonatal dermatological problems
- Pediatric and adolescent dermatological problems

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- Ageing of skin
- Geriatric dermatological problems

Skin lesions in nutritional metabolic and heritable disorders

- Cutaneous changes in nutritional disease
- Acrodermatitis enteropathica and other zinc deficiency disorders
- Cutaneous changes in errors of amino acid metabolism: Tyrosinemia II, phenylketonuria, arginine succinic aciduria, and alkaptonuria
- Amyloidosis of the skin
- The porphyrias
- Xanthomatosis and lipoprotein disorders
- Fobry's Disease; galactosidase - a deficiency (Angiokeratoma corporis diffusum universale)
- Lipid proteinosis
- Cutaneous mineralisation and ossification
- Heritable disorders of connective tissue with skin changes
- Heritable disease with increased sensitivity to cellular injury
- Basal cell Naevus syndrome

Skin manifestations of hematologic disorders

- Skin changes in hematological disease
- Langerhans cell and other cutaneous histiocytoses
- The Mastocytosis syndrome

Skin manifestations of systemic disease

- The skin and disorders of the alimentary tract
- The hepatobiliary system and the skin
- Cutaneous changes in renal disorders, cardiovascular, pulmonary disorders and endocrinal disorders
- Skin changes and diseases in pregnancy
- Skin changes in the flushing disorders and the carcinoid syndrome

Skin manifestations of rheumatologic disease

- Lupus Erythematosus
- Dermatomyositis
- Scleroderma
- Systemic Necrotizing Arteritis
- Cutaneous Necrotising venulitis
- Cryoglobulinemia and Cryofibrinogenemia
- Relapsing Polychondritis
- Rheumatoid Arthritis, Rheumatic Fever and Gout

- Sjogren's syndrome
- Raynaud's phenomenon
- Reiter's syndrome
- Multicentric Reticulohisticytosis

Cutaneous manifestations of disease in other organ systems

- Sarcoidosis of the skin
- Cutaneous manifestations of Internal Malignancy
- Acanthosis Nigricans
- Scleredema
- Papular Mucinosis
- Neurocutaneous disease
- Tuberous Sclerosis Complex
- The Neurofibromatosis
- Ataxia Telangiectasia
- Behcet's disease

Bacterial diseases with cutaneous involvement

- General considerations of bacterial diseases
- Pyodermas: Staphylococcus aureus, Streptococcus, and others
- Staphylococcal Scalded-Skin syndrome
- Soft Tissue Infections: Erysipelas, Cellulitis, Septicemia and Gangrenous Cellulitis
- Gram-Negative Coccal and bacillary infections
- Bartonellosis
- Miscellaneous bacterial infections with cutaneous manifestations
- Tuberculosis and other myopacterial infections
- Actinomycosis, Necardiosis, and Actinomycetoma
- Lyme Borreliosis
- Kawasaki Disease

Fungal diseases with cutaneous involvement

- Superficial fungal infection: Dermatophytosis, Tinea Nigra, Piedra
- Yeast Infections: Candidiasis, Pitryiasis (Tinea) Versicolor
- Deep Fungal Infections

Viral and ricketisial disease

- Viral Diseases: general consideration
- Rubella (German Measles)
- Measles
- Hand, Foot and Mouth Disease
- Herpangina

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- Erythema Infectiosum and Parvovirus B 19 infection
- Herpes simplex
- Varicella and Herpes Zoster
- Cytomegalovirus Infection
- Epstein - Barr Virus Infections
- Human Herpes virus 6 & 7 infections and Exanthem subitum (Roseola Infantum or Sixth Disease)
- Smallpox and Complications of small pox vaccination
- Contagious Pustular Dermatitis, Contagious Ecthyma: Orf virus infection
- Milluscum Contagiosum
- Miller's Nodules
- Warts
- Human Retroviral Disease: Human T-Lymphotropic Virusviruses

Therapeutics

Topical therapy

- Pharmacokinetics principles intopical applications of drugs.
- Principles of topical therapy.

Topical agents

- Glucocorticoids, Acne therapies, Analgesics, Anesthetics, Anti-inflammatory, Anti hair loss, Anti-microbial, Anti-parasitic, Anti-perspirants, Anti-pruritic, Anti-viral, Astringents, Bleaching agents, Keratolytics, Psoriasis therapies, Wart therapies, Topical Retinoids, Topical Antibiotics, Topical Anti-fungal Agents, Sun-protective Agents, Keratolytic Agents, Topical Cytotoxic Agents, Cosmetics and Skin care in practice.

Systemic therapy

- Systemic glucocorticoids, Sulfones, Aminoquinolines, Cytotoxic and Antimetabolic Agents, Oral Retinoids, Antihistamines, Antibiotics, Antiviral Drugs, Oral Antifungal Agents, Immunosuppressive and Immunomodulatory drugs, Thalidomide, photo-chemotherapy and photo-therpay, electric cautery, cryotherapy, electrolysis, tattooing, intra-lesional injections etc.

Surgery in dermatology

- Dermatologic Surgery: Introduction and Approach
- Skin Resurfacing: Chemical Peels
- Skin Resurfacing: Dermabrasion
- Skin Resurfacing: Laser
- Skin punch grafting
- Wound Dressings
- Cryosurgery

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- Nail Surgery

Venereology

- Clinical approach to the patient of sexually transmitted disease
- Anatomy of male and female genitalia
- Epidemiological aspects of STDs
- Viral STDs including HIV, Herpes, Human Papilloma virus (HPV), Molluscum contagiosum, Espirito Santo virus (ESV) etc.
- Bacterial STD's: Syphilis, Gonorrhoea, Chancroid, Donovanosis
- Chlamydial infections: Lymphogranuloma venereum, urethritis, cervicits, nongonococcal urethritis (NGU), non-specific vaginitis etc.
- Fungal: Candidiasis
- Protozoal: Trichomoniasis
- Ectoparasitic: Scabies, Pediculosis infestations.
- Syndromic management of STDs
- HIV/AIDS - Epidemiology, transmission, patient load, High risk groups, cutaneous manifestations of HIV, treatment of opportunistic infections, antiretroviral therapy, management of STDs in HIV positive cases
- STDs in reproduction health and Pediatrics
- STDs and HIV
- Prevention, counselling and education of different STDs including HIV
- National Control Programmes of STDs and HIV infection
- Medico-legal, social aspects of STDs including psychological and behavioural abnormalities in STD patients

Leprosy

- Approach to the patient with leprosy
- Epidemiological aspects
- Structure, biochemistry, microbiology of Mycobacterium leprae
- Animal models
- Pathogenesis
- Classification
- Immunology and molecular biological aspects
- Histopathology and diagnosis including laboratory aids
- Clinical features
- Reactions
- Systemic involvement (Ocular, bone, mucosa, testes and endocrine etc.)
- Pregnancy and leprosy
- HIV infection and leprosy

TEACHING AND LEARNING METHODS

A post graduate student pursuing the course should work in the institution as a full time student. No candidate should be permitted to run a clinic/laboratory/nursing home while studying postgraduate course. Each year should be taken as a unit for the purpose of calculating attendance. Every student shall attend teaching and learning activities during each year as prescribed by the department and should not be absent from work without valid reasons**.**

Teaching methodology:

A list of teaching and learning activities designed to facilitate students acquire essential knowledge and skills outlined is given below.

1. **Lectures:** Lectures are to be kept to a minimum. They may, however, be employed for teaching certain topics. Lectures may be didactic or integrated.
   a) **Didactic Lectures**: Few topics are suggested as examples:
      1) Bio-statistics
      2) Use of library
      3) Research Methodology
      4) Medical code of Conduct and Medical Ethics
      5) National Health and Disease Control Programmes
      6) Communication Skills

   These topics may preferably be taken up in the first few weeks of the first year.
   b) **Integrated Lectures:** Some of the topics may be taken up by multidisciplinary teams eg. Jaundice, Diabetes mellitus, Thyroid etc.

2. **Journal Club & Subject seminars:** Both are recommended to be held once a week. All PG students are expected to attend and actively participate in discussion and enter relevant details in the Log Book. Further, every post graduate student must make a presentation from the allotted journal(s), selected articles at least four times a year. The presentations would be evaluated and would carry weightage for internal assessment.
3. **Student Symposium**: Recommended as an optional multi-disciplinary programme. The evaluation may be similar to that described for subject seminar.
4. **Ward Rounds:** Ward rounds may be service or teaching rounds.
   a) **Service Rounds:** Post graduate students and Interns should be responsible for everyday care of the patients. Newly admitted patients should be worked up by the PGs and presented to the seniors the following day.
   b) **Teaching Rounds:** Every unit should have 'grand rounds' for teaching purpose. A diary (log book) should be maintained for day to day activities by the students.

   Entries of (a) and (b) should be made in the Log book. Log books shall be checked and assessed periodically by the faculty members imparting the training.

5. **Clinical Case Presentations:** Minimum of 5 cases to be presented by every post graduate student each year. They should be assessed using check lists and entries made in the log book

6. **Clinico-Pathological Conference (CPC):** Recommended once a month for all post graduate students. Presentation is to be done by rotation. If cases are not available, it could be supplemented by published CPCs.

7. **Inter-Departmental Meetings:** Strongly recommended particularly with Departments of Pathology and Radio-Diagnosis at least once a week. These meetings should be attended by post graduate students and relevant entries must be made in the Log Book.

Pathology: A dozen interesting cases may be chosen and presented by the post graduate students and discussed. The staff of Pathology department would then show the slides and present final diagnosis. In these sessions, the advances in immuno-histochemical techniques can be discussed.

Radiodiagnosis: Interesting cases and imaging modalities should be discussed.

8. Teaching Skills: The post graduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.

9. The post graduate students should undertake audit, use information technology tools and carry out research, both basic and clinical, with the aim of publishing the work and presenting the same at various scientific fora.

10. Continuing Medical Education Programmes (CME): At least two CME programmes should be attended by each student during the MD programme.

11. Conferences: The student should attend courses, conferences and seminars relevant to the speciality.

12. A postgraduate student of a postgraduate degree course in broad specialities/super specialities would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.

13. Department should encourage e-learning activities.

14. Rotation:

C**linical Postings**

A major tenure of posting should be in the Department of Dermatology. It should include care of in-patients, out-patients, special clinics like STD clinic, leprosy clinic, vitiligo clinic and maintenance of case records for both in- and out-patients.

A short posting for 2-4 weeks in the Department of Medicine is to be arranged for exposure to Emergency Medicine and Resuscitation.

15. Clinical meetings:

There should be intra - and inter- departmental meetings for discussing uncommon / interesting medical problems. Each student must be asked to present a specified number of cases for clinical discussion, perform procedures/tests/operations/present seminars/review articles from various journals in inter-unit/interdepartmental teaching sessions. These should be entered in a Log Book; log books should be checked and assessed periodically by the faculty members imparting the training.

16. Thesis writing:

Thesis writing is compulsory. All MD students are required to carry out work on a selected research project under the guidance of a recognized post graduate teacher, the result of which shall be written up and submitted in the form of a Thesis.

During the training programme, patient safety is of paramount importance, therefore, skills are to be learnt initially on the models, later to be performed under supervision followed by performing independently; for this purpose, provision of surgical skills laboratories in medical colleges is mandatory.

ASSESSMENT

FORMATIVE ASSESSMENT, i.e., during the training may be as follows:

Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self directed learning and ability to practice in the system.

Quarterly assessment during the MD training should be based on:

1. Journal based / recent advances learning
2. Patient based /Laboratory or Skill based learning
3. Self directed learning and teaching
4. Departmental and interdepartmental learning activity
5. External and Outreach Activities / CMEs

SUMMATIVE ASSESSMENT, i.e., at the end of training

The summative examination would be carried out as per the Rules given in POSTGRADUATE MEDICAL EDUCATION REGULATIONS, 2000.

The examination shall be in three parts:

1. Thesis

Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination. The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination. A post graduate student shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners.

2. Theory Examination:

There shall be four papers each of three hours duration. Each paper shall consist of two long essay questions, three short essay questions and four short notes. These are:

Paper – I	**Basic Science as applied to Dermatology, STDs and Leprosy**
Paper – II	**Dermatology**
Paper – III	**STD & Leprosy**
Paper – IV	**Recent advances in field of Dermatology, Applied Sciences pertaining to skin /VD & internal medicine and skin**

3. Clinical / Practical and viva voce Examination

Practical examination should be taken to assess competence and skills of techniques and procedures and should consist of two long cases, two short cases and 10 spots.

During oral/viva voce examination, student should be evaluated for Interpretation of data, instruments, clinical problems, radiological and biochemical investigations, slides, drugs, X-rays etc.

Recommended Reading:

Books (latest edition)

- Sexually Transmitted Diseases - Sharma V K
- IADVL Text book of Dermatology - R G Walia
- IAL Textbook of Leprosy - H Kar
- Bolognia “Textbook of Dermatology”
- Text Book of Dermatology, Wilkinson/Ebling/Rook, 4 Volumes, Oxford
- Text Book of Dermatology, Samuel L. Moschelia M.D. Harry J. Hurllay M.D., 2 Volumes
- Histopathology of the Skin, Walter - F. Lever- Gundula Schaumburg Lever
- Atlas of Dermatology, 2 Volumes, Bhalani Publishing House, Dadar, Mumbai.
- Diseases of the skin, I Iarry L Arnold Richard 13-Dom William D. James, Andrews
- Differential Diagnosis in Dermtology, Satish S. Savant, Radha Atalshah, Deepak Gore, Richard Ashan, Barbara Lepdard

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- Leprosy, Dharmendra, 2 Volumes, Samant and Company, Mumbai.
- Recent Advances in Dermatology, Champion, R.H. Pye, R.J. 8th Volumes.
- Venereal Diseases, Amborse King Claude Nicol Philip Rodin, EL.BS English Language Book Society/ Baillere Tindal, East Sussex.
- Sexually Transmitted Diseases, King K Holmes, McGraw-Hill Health profession
- Hand Book of leprosy, Jopling W.H, William Hethgunnah Medical Book Ltd., London.
- Dermatology in General Medicine, Thomas B. Fitzpatrick, McGraw Hill Book Company.
- Fundamentals of Pathology of skin, Mysore Venkataram

Journals

Three international and two national journals (all indexed)

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Annexure I

Postgraduate Students Appraisal Form
Clinical Disciplines

Name of the Department/Unit :

Name of the PG Student :

Period of Training : FROM……TO……

Sr. No.	PARTICULARS	Not Satisfactory	Satisfactory	More Than Satisfactory	Remarks
		1 2 3	4 5 6	7 8 9	
1.	Journal based / recent advances learning				
2.	Patient based /Laboratory or Skill based learning				
3.	Self directed learning and teaching				
4.	Departmental and interdepartmental learning activity				
5.	External and Outreach Activities / CMEs				
6.	Thesis / Research work				
7.	Log Book Maintenance				

Publications **Yes/ No**

Remarks*_____
_____
_____
_____

***REMARKS: Any significant positive or negative attributes of a postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.**

SIGNATURE OF ASSESSEE SIGNATURE OF CONSULTANT SIGNATURE OF HOD

Medical Council of India

NATIONAL MEDICAL COMMISSION
Postgraduate Medical Education Board

D 11011/1/22/AC/Guidelines/09 **Date: 01-08-22**

National Medical Commission

GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR M.D. IN GENERAL MEDICINE

GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR MD IN GENERAL MEDICINE

Preamble:

The purpose of post graduate (PG) education in General Medicine is to create specialists who would provide appropriate health care to the community and advance the cause of science through research, training and teaching the medical fraternity.

The competency-based training programme aims to produce a postgraduate doctor who after required training should be able to deal effectively with the medical needs of the community. The postgraduate specialist is also expected to know the principles of research methodology and be able to update himself with advances and practice evidence-based medicine. They should be trained to work in synchrony with faculty in super-speciality courses of Medicine and to follow a holistic approach to medical care which would lead to the development of good quality teachers. This document has been prepared by subject-content specialists of the National Medical Commission. The Expert Group of the National Medical Commission had attempted to render uniformity without compromise to the purpose and content of the document. Compromise in purity of syntax has been made in order to preserve the purpose and content. This has necessitated retention of "domains of learning" under the heading "competencies.

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SUBJECT SPECIFIC OBJECTIVES

Postgraduate training should enable the student to:

- Practice internal medicine with competence, with the help of scientific knowledge in an evidence based fashion.
- Conduct clinical examination and relevant investigations, diagnose medical conditions and refer early where indicated.
- Plan and deliver comprehensive treatment using the principles of rational drug therapy.
- Plan and advise measures for the prevention and rehabilitation of patients.

- Manage emergencies efficiently by providing Basic Life Support (BLS) and Advanced Life Support (ALS).
- Recognize conditions that may be outside of scope of general medicine and refer to an appropriate specialist.
- Exercise empathy and a caring attitude and maintain professional integrity, honesty and high ethical standards.
- Document case details including epidemiological data.
- Play the assigned role in the implementation of National Health Programs.
- Demonstrate competence in basic concepts of research methodology and clinical epidemiology; and preventive aspects of various disease states.
- Become a motivated 'teacher' - defined as one keen to share knowledge and skills with a colleague or a junior or any learner.
- Continue to evince keen interest in continuing education and use appropriate learning resources.
- Practice the medico-legal responsibilities.
- Undertake audit related to patient care, morbidity and mortality, use information technology tools and carry out research - both basic and clinical, with the aim of publishing the work and presenting the work at scientific forums.
- Participate in public health emergencies (arising in the community).
- Estimate the financial burden of care and practice health economics and rational approach to investigations.
- Communicate about the illness with patient's/relatives at all stages of care.

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SUBJECT SPECIFIC COMPETENCIES

By the end of the course, the student should have acquired knowledge (cognitive domain), professionalism (affective domain) and skills (psychomotor domain) as given below:

A. Predominant in Cognitive Domain:

1. Describe clinical features of diseases of various aetiology affecting all systems in the adult and geriatric population.

2. Apply the basic sciences knowledge in understanding and managing common diseases.
3. Describe the investigations to be undertaken at various levels like OPD, Ward, ICU etc. and choose them appropriately depending on the clinical features and epidemiologic principles.
4. Describe the pharmaco-therapeutics of various diseases and complications.
5. Describe and discuss the health issues related to environmental and ecological factors.
6. Describe and discuss the methods and mechanisms of rehabilitation following diseases.
7. Describe and discuss the issues related to palliative and terminal care.
8. Incorporate the national and international guidelines related to various diseases in day to day practice and teaching.
9. Describe and discuss the social and economic aspects of illnesses, outbreaks and epidemics.
10. Analyse the observations of disease patterns in patients and community and make suggestions for improvement in management and prevention.
11. Describe and discuss the National Health Programs.
12. Analyse and critique the publications related to various aspects of illnesses and evidence based medicine.
13. Describe and discuss the various levels of prevention in communicable and non - communicable diseases.
14. Describe and discuss various legislations related to organ transplant, brain death, informed consent, human rights etc.
15. Be updated on recent advances in internal medicine.

B. Affective Domain:

1. Should be able to function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the patient, relatives, paramedical and medical colleagues to provide the best possible comprehensive care.

2. Always adopt ethical principles and maintain professional etiquette in dealing with patients, relatives and other health personnel and to respect the rights of the patient including the right to information and second opinion.

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3. Develop communication skills to interact with patients, relatives, peers and paramedical staff, with special emphasis on breaking bad news empathetically.

4. Should demonstrate equity and equality when dealing with individuals of special groups (differently abled and LGBTQIA+).

C. Predominant in Psychomotor domain:

The post graduate student, at the end of the course should be able to perform the following skills, independently (PI) or under supervision (PS):

Clinical Assessment Skills

- Elicit a detailed clinical history (PI)
- Perform a thorough physical examination of all the systems (PI)

Procedural skills

- Pleural tap (PI)
- Lumbar puncture (PI)
- Arterial puncture for ABG (PI)
- Bone marrow aspiration and biopsy (PI)
- Abdominal paracentesis - diagnostic (PI)
- Aspiration of liver abscess (PI)

DESIRABLE

- Ultrasound abdomen at point of care (PI)
- Fine needle aspiration cytology (FNAC) from palpable lumps (PI)
- Pericardiocentesis (PS)
- Joint fluid aspiration (PI)
- Liver biopsy (PI)
- Kidney biopsy (PS)
- Cardiac-TMT (PS)
    - Holter monitoring (PS)
    - Echocardiography (point of care) (PS)
    - Doppler studies (PS)

Respiratory management

- Non-invasive and mechanical ventilation (PI)

Critically ill person

- Monitoring a sick person (PI)

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- Endotracheal intubation (PI)
- Cardio-pulmonary resuscitation(PI)
- Central vein cannulation and CVP monitoring (PI)
- Using a defibrillator (PI)
- Hemodialysis (PS)
- Certification of Brain death (PI)

Interpretation Skills

Interpretation of results of the following investigations, considering clinical data (history & examination findings).

- Treadmill testing (PI)
- ABG analysis (PI)
- Ultrasonography (PI)
- CT scan chest and abdomen (PI)
- CT scan head and spine (PI)
- MRI- Brain and spine (PI)
- Barium studies- desirable (PI)
- Pulmonary function tests (PI)
- Immunological investigations (PI)
- Nerve Conduction studies /EMG (PI)
- EEG (PI)
- Evoked Potential interpretation (PI)

Communication skills (PI)

While eliciting clinical history and performing physical examination, emphasize on:

- Communicating health and disease,
- Pre-test and post-test counseling for HIV,
- Pedagogy: teaching students, other health functionaries: lectures, bedside clinics, discussions,
- Health education: prevention of common medical problems, promoting healthy life-style, immunization, periodic health screening, counseling skills in risk factors for

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common malignancies, cardiovascular disease, AIDS etc.

- Dietary counseling in health and disease,
- Linking patients with community resources,
- Providing referral,
- Genetic counseling,
- Communicating bad news to the patient and relatives.

Others

- ***Demonstration of the following:*** **(PI)**
  - professionalism
  - ethical behavior (humane and professional care to patients)
- ***Utilization of information technology***
  - Medline search, Internet access, computer usage
- ***Research methodology***
  - designing a study
  - interpretation and presentation of scientific data
- ***Self-directed learning***
  - identifying key information sources
  - literature searches
  - information management
- ***Therapeutic decision-making***
  - managing multiple problems simultaneously
  - assessing risks, benefits and costs of treatment options
  - involving patients in decision-making
  - selecting specific drugs within classes
  - rational use of drugs

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Syllabus

Course contents:

A: Cognitive domain:

Basic Sciences

1. Basics of human anatomy as relevant to clinical practice:

- Surface anatomy of various viscera

- Neuro-anatomy
- Important structures/organ's location in different anatomical locations in the body
- Histology of organs
- Blood supply, nerve supply to various organs

2. Applied physiology of various organ systems:
    - Basic functioning of various organ-system, control of vital functions.
    - pathophysiological alteration in diseased states.
    - interpretation of symptoms and signs in relation to pathophysiology.
    - Physiology of temperature, sleep regulation.

3. Applied biochemical basis of various diseases including fluid and electrolyte disorders:
    - Acid - base disorders, disorders of carbohydrate, fat, protein, calcium, phosphorous and iron metabolism.
    - Interpretation and clinical application of various biochemical tests.

4. Applied pathology of different diseases.
    - Common pathological changes in various organs associated with diseases and their correlation with clinical signs.
    - Understanding of various pathogenic processes and possible therapeutic interventions, and
    - Preventive measures at various levels to reverse or arrest the progression of diseases.

5. Knowledge about various microorganisms, their special characteristics important for their pathogenetic potential or of diagnostic help:
    - Important organisms associated with tropical diseases, their growth pattern/life-cycles,
    - Levels of therapeutic interventions possible in preventing and/or eradicating the organisms,
    - Antimicrobial resistance,
    - Antibiotic stewardship,
    - Hospital infection control,
    - Biomedical waste management,
    - Vaccinology.

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6. Knowledge about pharmacokinetics and pharmaco-dynamics of the drugs used for the management of common problems in a normal person and in patients with diseases of kidneys/liver/systemic disorders which may need alteration in doses due to abnormal metabolism/excretion of the drugs:

    - pharmacokinetics and pharmaco-dynamics of drugs: principles and methodology
    - Rational use of available drugs.
    - Principles of drug therapy,
    - Adverse drug reactions,
    - Drug interaction,
    - Pharmacovigilance,
    - Drug abuse and addiction,
    - Drug development,
    - Pharmacoeconomics,
    - Pharmacogenomics.

7. Research methodology, study designs, clinical epidemiology and biostatistics relevant to medical sciences.

8. National Health Programmes:

    - investigation of community outbreak,
    - public health policy,
    - health promotion,
    - prevention of communicable and non-communicable diseases.
    - International health regulations,
    - Travel medicine.

9. Knowledge about various poisons with specific reference to different geographical and clinical settings - their diagnosis and management.

    - Knowledge about snake bite, other bites and stings,
    - medicolegal aspects.

Systemic Medicine

10. Preventive and environmental issues, including principles of preventive health care, immunization and occupational, environmental medicine and bioterrorism,

    - Health tourism,

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- Rehabilitation,
- Drowning,
- Heat and altitude related disorders.

11. Geriatric Medicine:

- Physiology and biology of aging and various organ changes in elderly.
- Principles of geriatric medicine and uniqueness of geriatric presentation.
- Physical examination of geriatric patient.
- drug metabolism, laboratory tests in elderly.
- Management of unique problems related to elderly such as nutrition, falls, gait disorders, neuro- psychiatric problems etc.
- Mental health disorders,
- Elderly neglect and abuse,
- Social and family support and rehabilitation of elderly.
- Assessment of functional and cognitive aspects, counseling and communication with elderly.
- Appropriate medication and avoidance of poly-pharmacy.

12. Genetics:

- Overview of the paradigm of genetic contribution to health and disease
- Principles of Human Genetics
- Genetic basis of medical disorders
- Single gene and chromosomal disorders
- Genetic counseling
- Prevention of genetic disorders
- Genetic analysis
- Gene therapy

13. Immunology:

- Innate and adaptive immune systems
- Mechanisms of immune mediated cell injury
- HLA system, primary and secondary immune-deficiency,
- Allergic disorders: urticaria, angioedema, anaphylaxis and other allergic disorders.
- Transplantation immunology, immunocomplex disorders, organ specific and multisystem immune disorders, monoclonal antibodies.

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14. Cardio-vascular diseases:

- Approach to the patient with possible cardio-vascular diseases
- Investigative cardiology
- Heart failure
- Arrhythmias
- Hypertension
- Coronary artery disease
- Valvular heart disease
- Infective endocarditis
- Diseases of the myocardium and pericardium
- Diseases of the aorta and peripheral vascular system
- Congenital heart diseases
- Pulmonary arterial hypertension
- Cor pulmonale

15. Respiratory system:

- Approach to the patient with respiratory diseases
- Investigative pulmonology
- Disorders of ventilation
- Asthma
- Chronic Obstructive Pulmonary Disease (COPD)
- Bronchiectasis
- Occupational lung diseases
- Interstitial lung diseases
- Hypersensitivity Pneumonitis
- Pneumonia and suppurative lung diseases
- Pulmonary embolism
- Cystic fibrosis
- Obstructive sleep apnoea syndrome and diseases of the chest wall, pleura and mediastinum
- Pulmonary manifestations of systemic diseases

16. Nephrology:

- Approach to the patient with renal diseases
- Acute kidney injury

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- Chronic kidney disease
- Glomerular diseases
- Nephrotic syndrome
- Reno vascular hypertension
- Cystic Diseases of the kidney
- Tubulo-interstitial diseases
- Nephrolithiasis
- Urinary tract infection and pyelonephritis
- Diabetes and the kidney
- Obstructive uropathy and treatment of irreversible renal failure
- Dialysis
- Renal involvement in systemic diseases

17. Gastro-intestinal diseases:

- Approach to the patient with gastrointestinal diseases
- Gastrointestinal endoscopy
- Motility disorders
- Diseases of the esophagus
- Acid peptic disease
- Functional gastrointestinal disorders
- Diarrhea
- Malabsorption syndromes
- Irritable bowel syndrome
- Inflammatory bowel diseases
- Mesenteric vascular insufficiency
- Diverticular disease
- Acute intestinal obstruction
- Peritonitis
- Diseases of the rectum and anus

18. Diseases of the liver and gall bladder:

- Approach to the patient with liver disease
- Interpretation of liver function tests
- Hyperbilirubinemia
- Acute viral hepatitis
- Drug induced /toxic hepatitis

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- Chronic hepatitis
- Alcoholic and non-alcoholic steatohepatitis
- Cirrhosis and its sequelae/ complications
- Portal hypertension
- Budd Chiari syndrome
- Hepatic failure and liver transplantation
- Diseases of the gall bladder and bile ducts
- Disease of pancreas including pancreatitis

19. Haematologic diseases:

- Hematopoiesis
- Anemias
- Leucopenia and leukocytosis
- Myelo-proliferative disorders
- Bone marrow failure syndromes
- Plasma cell disorders
- Disorders of hemostasis and haemopoietic stem cell transplantation
- Platelet Disorders
- Hypercoagulable conditions
- Blood components and transfusion medicine

20. Oncology:

- Epidemiology
- Biology and genetics of cancer
- Approach to patient with cancer
- Early detection or prevention of cancer
- Infection in cancer patients
- Oncological emergencies
- Paraneoplastic syndromes and endocrine manifestations of tumours
- Metastatic cancer of unknown primary site
- Hematological malignancies
- Cancers of various organ systems and cancer chemotherapy
- Rehabilitation and palliative care in cancer patients.

21. Metabolic diseases - inborn errors of metabolism and disorders of metabolism:

- Hemochromatosis

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- Wilson's disease
- Porphyrias
- Other inborn errors of metabolism.

22. Nutritional diseases:

- Nutritional assessment, Anthropometry
- Enteral and parenteral nutrition
- Obesity and eating disorders.
- Malnutrition
- Vitamin and trace element deficiencies and excess.

23. Endocrine diseases:

- Approach to patients with endocrine disorders
- Disorders of Pituitary
- Disorders of thyroid gland
- Disorders of adrenal cortex
- Pheochromocytoma
- Multiple endocrine neoplasia
- Autoimmune polyendocrine syndromes
- Reproductive endocrinology including menopause and postmenopausal hormone therapy
- Diabetes mellitus
- Hypoglycemia
- Metabolic Syndrome
- Dyslipidemia
- Disorders of parathyroid gland
- Disorders of bone and mineral metabolism in health and disease
- Osteoporosis

24. Rheumatic diseases:

- Approach to the patient with rheumatic diseases
- Osteoarthritis
- Rheumatoid arthritis
- Spondyloarthropathies
- Systemic lupus erythematosus (SLE)
- Sarcoidosis

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- Sjogren's syndrome
- Systemic sclerosis
- Anti-phospholipid antibody syndrome
- Bechet's disease
- Vasculitis syndromes
- Acute rheumatic fever
- Inflammatory myopathies
- Arthritis associated with systemic diseases
- Gout and crystal associated arthritis
- Relapsing polychondritis
- IgG4 related disease
- Polymyalgia rheumatica
- Fibromyalgia
- Amyloidosis

25. Infectious diseases:

- Basic consideration in Infectious Diseases
- Clinical syndromes
- Community acquired clinical syndromes
- Nosocomial infections
- Infections in immunocompromised
- Bacterial diseases - General consideration, diseases caused by gram - positive bacteria, diseases caused by gram - negative bacteria, miscellaneous bacterial infections, Atypical bacterial infections - Mycobacterial diseases, Spirochetal diseases, Rickettsial disease, Mycoplasma and Chlamydia.
- Viral diseases - DNA viruses, RNA viruses, HIV infection, Emerging viral diseases - Coronavirus, Nipha virus, H1N1 virus, Hantavirus.
- Fungal infections,
- Protozoal infections,
- Helminthic infections.

26. Neurology

- Approach to the patient with neurologic diseases,
- Diagnostic neurology,
- Localization of neurological disease/s,

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- Headache,
- Seizure disorders and epilepsy,
- Coma,
- Disorders of sleep,
- Cerebrovascular diseases,
- Cranial neuropathy,
- Dementias and neurodegenerative diseases,
- Brain abscess,
- Demyelinating diseases,
- Parkinson's disease and other movement disorders,
- Motor neuron diseases,
- Ataxic and gait disorders,
- Meningitis and encephalitis,
- Prion diseases,
- Peripheral neuropathies,
- Muscle diseases,
- Diseases of spinal cord
- Diseases of neuromuscular transmission,
- Autonomic disorders and their management.

27. Psychiatric disorders

Common psychiatric disorders in adult & geriatric population:

- Mood (affective) disorders,
- Anxiety disorders,
- Schizophrenia,
- Organic mental disorders,
- Eating disorders,
- Sexual disorders,
- Personality disorder and suicide and self-harm,
- Autistic disorders,
- Functional and psychosomatic disorder,
- Somatoform disorder,
- Dissociative/ conversion disorder.
- Substance use disorders.

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28. Dermatology:

- Structure and functions of skin.
- Infections of skin.
- Papulo-squamous and inflammatory skin rashes.
- Photo-dermatology.
- Erythroderma.
- Cutaneous manifestations of systematic diseases.
- Bullous diseases.
- Drug induced rashes.
- Disorders of hair and nails.
- Principles of topical therapy.

29. Critical care medicine

- Approach to patient with critical illness.
- Acute respiratory distress syndrome.
- Mechanical ventilatory support.
- Approach to patient with shock.
- Sepsis and septic shock.
- Cardiogenic shock and pulmonary edema.
- Cardiovascular collapse and cardiac arrest.
- Cardiopulmonary resuscitation.

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30. Miscellaneous

- Medical illnesses in pregnancy
- Peri-operative evaluations

B: Psychomotor domain: Detailed guidelines on this section are given under Subject specific competencies.

TEACHING AND LEARNING METHODS

General principles

Acquisition of competencies being the keystone of doctoral medical education, such training should be skills oriented. Learning in the program, essentially autonomous and self-directed,

and emanating from academic and clinical work, shall also include assisted learning. The formal sessions are meant to supplement this core effort.

All students joining the postgraduate (PG) courses shall work as full-time (junior) residents during the period of training, attending not less than 80% of the training activity during the calendar year, and participating in all assignments and facets of the educational process. They shall maintain a log book for recording the training they have undergone, and details of the procedures done during laboratory and clinical postings in real time.

Teaching-Learning methods

This should include a judicious mix of demonstrations, symposia, journal clubs, clinical meetings, seminars, small group discussion, bed-side teaching, case-based learning, simulation-based teaching, self-directed learning, integrated learning, interdepartmental meetings and any other collaborative activity with the allied departments. Methods with exposure to the applied aspects of the subject relevant to basic/clinical sciences should also be used. **The suggested examples of teaching-learning methods are given below but are not limited to these. The frequency of various below mentioned teaching-learning methods can vary based on the subject's requirements, competencies, work load and overall working schedule in the concerned subject.**

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Self Directed Learning (SDL) is an extension of the role of lifelong learner envisaged in the goals of the Indian Medical Graduate. All postgraduate students are expected to learn through Problem Based Learning, SDL, Project Based learning etc. Various forms of self-learning including those mediated through IT - enhanced methodologies must be adopted. Specific hours need not be ear-marked, but these should be integrated into day to day practice.

Post graduates in all specialities are expected to learn through work-based discussions and experiential learning. Beyond documentations in logbook, they should demonstrate competency related to patient care, interpretation and communication skills during the routine work in wards, OPD, ICUs, district residency postings etc. They should be involved in teaching of Undergraduate (MBBS) students also.

A. Lectures: Didactic lectures should be used sparingly. A minimum of 10 lectures per year in the concerned PG department is suggested. Topics are to be selected as per subject

requirements. All postgraduate trainees will be required to attend these lectures. Lectures can cover topics such as:

1. Subject related important topics as per specialty requirement
2. Recent advances
3. Research methodology and biostatistics
4. **Salient features of** Undergraduate/Postgraduate medical curriculum
5. Teaching and assessment methodology.

Topic numbers 3, 4, 5 can be done during research methodology/biostatistics and medical education workshops in the institute.

B. Journal club: Minimum of once in 1-2 weeks is suggested.

Topics will include presentation and critical appraisal of original research papers published in peer reviewed indexed journals. The presenter(s) shall be assessed by faculty and grades recorded in the logbook.

C. Student Seminar: Minimum of once every 1-2 weeks is suggested.

Important topics should be selected as per subject requirements and allotted for in-depth study by a postgraduate student. A teacher should be allocated for each seminar as faculty moderator to help the student prepare the topic well. It should aim at comprehensive evidence-based review of the topic. The student should be graded by the faculty and peers.

D. Student Symposium: Minimum of once every 3 months.

A broad topic of significance should be selected, and each part shall be dealt by one postgraduate student. A teacher moderator should be allocated for each symposium and moderator should track the growth of students. The symposium should aim at an evidence-based exhaustive review of the topic. All participating postgraduates should be graded by the faculty and peers.

E. Laboratory work / Bedside clinics: Minimum - once every 1-2 weeks.

Laboratory work/Clinics/bedside teaching should be coordinated and guided by faculty from the department. Various methods like DOAP (Demonstrate, Observe, Assist, Perform), simulations in skills lab, and case-based discussions etc. are to be used. Faculty from the department should participate in moderating the teaching-learning sessions during clinical rounds.

F. Interdepartmental colloquium

Faculty and students must attend monthly meetings between the main Department and other department/s on topics of current/common interest or clinical cases.

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G. (a). Rotational clinical / community / institutional postings

Depending on local institutional policy and the subject specialty needs, postgraduate trainees may be posted in relevant departments/ units/ institutions. The aim would be to acquire more in-depth knowledge as applicable to the concerned specialty. Postings would be rotated between various units/departments and details to be included in the specialty-based Guidelines. Few examples are listed below:

- Broad specialty departments
- Emergency/Casualty department
- Super specialty departments e.g. Cardiology / Endocrinology / Nephrology / Medical Oncology etc.
- Laboratory-based specialty units/departments e.g. Biochemistry/Microbiology/ Infection control unit/Laboratory Medicine etc.

G. (b). Posting under "District Residency Programme" (DRP):

All postgraduate students pursuing MS/MS in broad specialties in all Medical Colleges/Institutions shall undergo a compulsory rotation of three months in District Hospitals/District Health System as a part of the course curriculum, as per the Postgraduate Medical Education (Amendment) Regulations (2020). Such rotation shall take place in the 3rd or 4th or 5th semester of the Postgraduate programme and the rotation shall be termed as "District Residency Programme" and the PG medical student undergoing training shall be termed as "District Resident".

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Every posting should have its defined learning objectives. It is recommended that the departments draw up objectives and guidelines for every posting offered in conjunction with the collaborating department/s or unit/s. This will ensure that students acquire expected competencies and are not considered as an additional helping hand for the department / unit in which they are posted. The PG student must be tagged along with those of other relevant departments for bedside case discussion/basic science exercises as needed, under the guidance of an assigned faculty.

Opportunities to present and discuss infectious disease cases through bedside discussion and ward/grand rounds with specialists / clinicians in different hospital settings must be scheduled to address antimicrobial resistance issues and strategies to deal with it.

H. Teaching research skills

Writing a thesis should be used for inculcating research knowledge and skills. All postgraduate students shall conduct a research project of sufficient depth to be presented to the University as a postgraduate thesis under the supervision of an eligible faculty member of the department as guide and one or more co-guides who may be from the same or other departments.

In addition to the thesis project, every postgraduate trainee shall participate in at least one additional research project that may be started or already ongoing in the department. It is preferable that this project will be in an area different from the thesis work. For instance, if a clinical research project is taken up as thesis work, the additional project may deal with community/field/laboratory work. Diversity of knowledge and skills can thereby be reinforced.

I. Training in teaching skills

MEU/DOME should train PG students in education methodologies and assessment techniques. The PG students shall conduct UG classes in various courses and a faculty shall observe and provide feedback on the teaching skills of the student.

J. Log book

During the training period, the postgraduate student should maintain a Log Book indicating the duration of the postings/work done in Wards, OPDs, Casualty and other areas of posting. This should indicate the procedures assisted and performed and the teaching sessions attended. The log book entries must be done in real time. The log book is thus a record of various activities by the student like: (1) Participation & performance, (2) attendance, (3) participation in sessions, (4) completion of pre-determined activities, and (5) acquisition of selected competencies.

The purpose of the Log Book is to:

a) help maintain a record of the work done during training,
b) enable Faculty/Consultants to have direct information about the work done and intervene, if necessary,
c) provide feedback and assess the progress of learning with experience gained periodically.
d) Documentation of acquisition required competencies

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The Log Book should be used in the internal assessment of the student; should be checked and assessed periodically by the faculty members imparting the training. The PG students will be required to produce completed log book in original at the time of final practical examination. It should be signed by the Head of the Department. A proficiency certificate from the Head of Department regarding the clinical competence and skillful performance of procedures by the student will be submitted by the PG student at the time of the examination.

The PG students shall be trained to reflect and record their reflections in log book particularly of the critical incidents. Components of good teaching practices must be assessed in all academic activity conducted by the PG student and at least two sessions dedicated for assessment of teaching skills must be conducted every year of the PG program. The teaching faculty are referred to the MCI Logbook Guidelines uploaded on the Website.

K. **Course in Research Methodology**: All postgraduate students shall complete an online course in Research Methodology within six months of the commencement of the batch and generate the online certificate on successful completion of the course.

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Other aspects

- The Postgraduate trainees must participate in the teaching and training program of undergraduate students and interns attending the department.
- Trainees shall attend accredited scientific meetings (CME, symposia, and conferences) at least once a year.
- Department shall encourage e-learning activities.
- The Postgraduate trainees should undergo training in Basic Cardiac Life Support (BCLS) and Advanced Cardiac Life Support (ACLS).
- The Postgraduate trainees must undergo training in information technology and use of computers.

During the training program, patient safety is of paramount importance; therefore, relevant clinical skills are to be learnt initially on the models, later to be performed under supervision followed by independent performance. For this purpose, provision of skills laboratories in medical colleges is mandatory.

ASSESSMENT

FORMATIVE ASSESSMENT, ie., assessment to improve learning

Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self-directed learning and ability to practice in the system.

General Principles

Internal Assessment should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills.

The Internal Assessment should be conducted in theory and practical/clinical examination, should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills.

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Quarterly assessment during the MD training should be based on:

- Case presentation, case work up, case handling/management : once a week
- Laboratory performance : twice a week
- Journal club : once a week
- Seminar : once a fortnight
- Case discussions : once a fortnight/month
- Interdepartmental case or seminar : once a month

Note: These sessions may be organized and recorded as an institutional activity for all postgraduates.

- Attendance at Scientific meetings, CME programmes (at least 02 each)

The student to be assessed periodically as per categories listed in appropriate (non-clinical/clinical) postgraduate student appraisal form (Annexure I).

SUMMATIVE ASSESSMENT, ie., assessment at the end of training

Essential pre-requisites for appearing for examination include:

1. **Log book** of work done during the training period including rotation postings, departmental presentations, and internal assessment reports should be submitted.

2. At least **two presentations** at national level conference. One research paper should be published / accepted in an indexed journal**. (It is suggested that the local or University Review committee assess the work sent for publication).**

The summative examination would be carried out as per the Rules given in the latest POSTGRADUATE MEDICAL EDUCATION REGULATIONS. The theory examination shall be held in advance before the Clinical and Practical examination, so that the answer books can be assessed and evaluated before the commencement of the clinical/Practical and Oral examination**.**

The postgraduate examination shall be in three parts**:**

1. **Thesis**

   Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination. The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination. A post graduate student in broad specialty shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners**.**

2. **Theory examination**

   The examinations shall be organized on the basis of 'Grading' or 'Marking system' to evaluate and to certify post graduate student's level of knowledge, skill and competence at the end of the training, as given in the latest POSTGRADUATE MEDICAL EDUCATION REGULATIONS. Obtaining a minimum of 50% marks in 'Theory' as well as 'Practical' separately shall be mandatory for passing examination as a whole. The examination for M.D./ M.S shall be held at the end of 3rd academic year.

   There shall be four theory papers (as per PG Regulations).

   Paper I: Basic sciences as applied to the subject

   Paper II: Therapeutics & Tropical Medicine

   Paper III: Sytstemic Medicine of all organ systems

   Paper IV: Recent advances in the subject.

3. **Practical/clinical and Oral/viva voce examination**

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Practical examination

Practical examination should be spread over **two** days and include various major components of the syllabus focusing mainly on the psychomotor domain.

Oral/Viva voce examination on defined areas should be conducted by each examiner separately. Oral examination shall be comprehensive enough to test the post graduate student's overall knowledge of the subject focusing on psychomotor and affective domain.

The final clinical examination in broad specialty clinical subjects should include:

- Cases pertaining to major systems (eg. one long case and three short cases)
- Stations for clinical, procedural and communication skills
- Log Book Records and reports of day-to-day observation during the training
- It is emphasized that Oral/viva voce examination shall be comprehensive enough to test the post graduate student's overall knowledge of the subject.

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Recommended Reading:

Text Books (latest edition)

1. API Text book of Medicine
2. Davidson's Principles and Practice of M
3. Harrison's Principles & Practice of Medicine
4. Oxford Text book of Medicine
5. Kumar & Clark: Book of Clinical Medicine
6. Cecil: Text Book of Medicine
7. Current medical diagnosis and treatment
8. Washington manual of medical therapeutics
9. Krishnadas. K.V: Text Book of Medicine

Journals

03-05 international Journals and 02 national (all indexed) journals.

Annexure 1

Student appraisal form for MD in General Medicine											
	Element	**Less than Satisfactory**			**Satisfactory**			**More than satisfactory**			**Comments**
		1	2	3	4	5	6	7	8	9	
1	**Scholastic Aptitude and Learning**										
1.1	Has Knowledge appropriate for level of training										
1.2	Participation and contribution to learning activity (e.g., Journal Club, Seminars, CME etc)										
1.3	Conduct of research and other scholarly activity assigned (e.g Posters, publications etc)										
1.4	Documentation of acquisition of competence										
	(eg Log book)										
1.5	Performance in work based assessments										
1.6	Self- directed Learning										
2	**Care of the patient**										
2.1	Ability to provide patient care appropriate to level of training										
2.2	Ability to work with other members of the health care team										
2.3	Ability to communicate appropriately and empathetically with patients families and care givers										
2.4	Ability to do procedures appropriate for the level of training and assigned role										
2.5	Ability to record and document work accurately and appropriate for level of training										

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2.6	Participation and contribution to health care quality improvement										
3	**Professional attributes**										
3.1	Responsibility and accountability										
3.2	Contribution to growth of learning of the team										
3.3	Conduct that is ethical appropriate and respectful at all times										
4	**Space for additional comments**										
5	**Disposition**										
	Has this assessment been discussed with the trainee?	Yes	No								
	If not explain										
	Name and Signature of the assesse										
	Name and Signature of the assessor										
	Date										

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GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR MD IN RADIODIAGNOSIS

Preamble:

The purpose of PG education is to create specialists who would provide high quality health care and advance the cause of science through research & training.

The Goal of this program is to impart training in conventional and modern radiology and imaging techniques so that the post graduate student becomes well versed and competent to practice, teach and conduct research in the discipline of radiology. The student should also acquire basic knowledge in the various sub-specialities of radiology. These Guidelines also would also help to standardize Radiodiagnosis teaching at post graduate diploma (DMRD) level throughout the country so that it will benefit in achieving competent radiologist with appropriate expertise.

The purpose of this document is to provide teachers and learners illustrative guidelines to achieve defined outcomes through learning and assessment. This document was prepared by various subject-content specialists. The Reconciliation Board of the Academic Committee has attempted to render uniformity without compromise to purpose and content of the document. Compromise in purity of syntax has been made in order to preserve the purpose and content. This has necessitated retention of “domains of learning” under the heading “competencies”.

SPECIFIC LEARNING OBJECTIVES

The objective of the program is to train a student to become a skilled and competent radiologist to conduct and interpret various diagnostic/interventional imaging studies (both conventional and advanced imaging), to organize and conduct research and teaching activities and be well versed with medical ethics and legal aspects of imaging/ intervention.

SUBJECT SPECIFIC COMPETENCIES

A. Cognitive Domain

A post graduate student on completing MD (Radiodiagnosis) should acquire knowledge in the following areas, and be able to:

1. Acquire good basic knowledge in the various sub-specialties of radiology such as chest radiology, neuro-radiology, GI-radiology, uro-radiology, cardio-vascular-radiology, musculoskeletal, interventional radiology, emergency radiology, pediatric radiology and women’s imaging.

2. Independently conduct and interpret all routine and special radiologic and imaging investigations.
3. provide radiological services in acute emergency and trauma including its medico-legal aspects.
4. Elicit indications, diagnostic features and limitation of applications of ultrasonography, CT and MRI and should be able to describe proper cost-effective algorithm of various imaging techniques in a given problem setting.
5. Decide on the various image-guided interventional procedures to be done for diagnosis and therapeutic management.
6. Able to decide on further specialization to be undertaken in any of the branches in Radiodiagnosis such as gastrointestinal radiology, uro-radiology, neuro-radiology, vascular radiology, musculoskeletal radiology, interventional radiology etc.
7. Able to formulate basic research protocols and carry out research in the field of radiology- related clinical problems.
8. Acquire knowledge and teaching capabilities to work as a post graduate student /consultant in Radiodiagnosis and conduct teaching programmes for undergraduates, post graduates as well as paramedical and technical personnel.
9. interact with other specialists and super-specialists so that maximum benefit accrues to the patient.
10. Should be able to organize CME activities in the specialty utilizing modern methods of teaching and evaluation.
11. Acquire knowledge to impart training in both conventional radiology and modern imaging techniques so that the post graduate student is fully competent to practice, teach and do research in the broad discipline of radiology including ultrasound, Computed Tomography and Magnetic Resonance Imaging.
12. Acquire knowledge of interventional radiology.

B. Affective Domain:

1. Should be able to function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the patient and the clinician or other colleagues to provide the best possible diagnosis or opinion.

2. Always adopt ethical principles and maintain proper etiquette in dealings with patients, relatives and other health personnel and to respect the rights of the patient including the right to information and second opinion.

3. Develop communication skills to word reports and professional opinion as well as to interact with patients, relatives, peers and paramedical staff, and for effective teaching.

C. Psychomotor domain

Practical Training will include two major aspects:

A) Interpretation of images, and

B) Skill in performing a procedure.

A) Interpretation of images:

The student should be able to interpret images on all imaging modalities of diseases of following organs :

1. **Musculo-skeletal System -** Interpretation of diseases of muscles, soft tissue, bones and joints including congenital, inflammatory, traumatic, endocrine and metabolic, neoplastic and miscellaneous conditions.
2. **Respiratory System -** Interpretation of diseases of the chest wall, diaphragm, pleura and airway; pulmonary infections, pulmonary vasculature; pulmonary neoplasm; diffuse lung disease; mediastinal disease, chest trauma; post-operative lung and X-ray in intensive care.
3. **Cardiovascular System** - Interpretation of diseases and disorders of cardiovascular system (congenital and acquired conditions) and the role of imaging by conventional radiology, ultrasound, colour Doppler, CT, MRI, Angiography and Isotopes Studies.
4. **Gastro-intestinal tract and hepato-biliary pancreatic system** - Interpretation of diseases and disorders of mouth, pharynx, salivary glands, esophagus, stomach, small intestine, large intestine, diseases of omentum, peritoneum and mesentery: acute abdomen, abdominal trauma. Diseases and disorders of liver, biliary system and pancreas**.**
5. **Urogenital System** - Interpretation of various diseases and disorders of genitor-urinary system. These include: congenital, inflammatory, traumatic, neoplastic, calculus disease and miscellaneous conditions.
6. **Central Nervous System (C.N.S.) -** Interpretation of diseases and disorders of the head, neck and spine covering, congenital, infective, vascular, traumatic neoplastic degeneration metabolic and miscellaneous condition.
7. Imaging in Emergency Medicine.
8. Imaging in Obstetrics and Gynecology.
9. Imaging of Breast and interventional procedures.
11. ENT, EYE and Dental Imaging**.**
11. Imaging of endocrine glands and those involved with metabolic diseases.
12. Clinical applied radionuclide imaging.
13. Interventional Radiology

B) Skills in performing a procedure

The student should be able to perform the following procedures:

1) **GIT contrast studies:** Barium studies (swallow, upper GI, Follow through, enema);

fistulogram; sialogram; cologram/ileostogram,

2) **GU:** Excretory urography, MCU, RGU, nephrostogram, genitogram,
3) **Ultrasound:** Studies of whole body including neonatal transfontanell studies, Doppler studies,
4) **CT scan:** should be able to position a patient, plan study as per the clinical indication, do reconstruction of images, perform triple phase study, perform & interpret advanced applications like CT enterography, CT angiography etc.
5) **MRI:** plan and perform MRI studies of whole body
6) **DSA:** should be able to describe the techniques, do (if available to student) transfemoral puncture and insert catheter, help in angiographic procedures both diagnostic and interventional.
7) **Radiography:** should be able to independently do radiography of common and some important uncommon views of different body parts. This includes positioning, centering of X ray beam, setting of exposure parameters, exposing and developing the films. The student should be familiar with not only conventional radiography but with CR and DR systems.
8) **Interventional radiology:** The student should be able to perform simple, common non- vascular procedures under ultrasound and fluoroscopy guidance e.g. abscess drainage, drainage catheter placement, nephrostomy, biliary drainage etc. The student should have knowledge of common vascular interventions e.g stricture dilatation using balloon catheters, embolization with gel foam and other agents, names of common catheters, handling of intravenous contrast reactions; techniques, indications and contraindications for various procedures;

Syllabus

Course contents:

Anatomy

Gross and cross sectional anatomy of all the body systems.

Pathology

Gross morphology of pathological conditions of systemic diseases affecting all organ systems.

Radiology Course

This would cover imaging and interventions of diseases affecting all the body systems:

- Chest
- Cardiovascular system
- Musculoskeletal including soft tissue
- Gastrointestinal system
- Hepato-biliary-pancreatic system
- Urogenital (genito-urinary) system

- CNS including head and neck
- Obstetrics and gynaecology
- ENT, eye, dental, breast
- Endocrine and metabolic system
- Clinically applied radionuclide imaging

Radiological Physics

1. Introduction of general properties of radiation and matter: Fundamentals of nuclear physics and radioactivity
2. Interaction of x-rays and gamma rays with matter and their effects on irradiated materials
3. X-ray Generating Apparatus
4. Screen-film radiography
5. Film processing: Dark room, dry processing, laser /dry chemistry cameras, artifacts.
6. Fluoroscopy: Digital including flat panel units, fluoroscopy cum radiography units
7. Digital radiography: Computed Radiography, Flat panel radiography
8. Other equipments: Ultrasound including Doppler, CT, MRI and DSA
9. Contrast Media (Iodinated, MR & Ultrasound) - types, chemical composition, mechanism of action, dose schedule, route of administration, adverse reaction and their management
10. Nuclear Medicine: Equipments and isotopes in various organ systems and recent advances
11. Picture Archiving and Communication System (PACS) and Radiology Information System (RIS) to make a film-less department and for Teleradiology
12. Radiation protection, dosimetry and radiation biology
13. Image quality and Quality Assurance (QA)
14. Recent advances in radiology and imaging

The student should have knowledge of the following physics experiments:

- Check accuracy of kVp and timer of an X ray unit
- Check accuracy of congruence of optical radiation field
- Check perpendicularity of x ray beam
- Determine focal spot size
- Check linearity of timer of x ray unit
- Check linearity of mA
- Verification of inverse square law for radiation
- Check film screen contact
- Check film screen resolution
- Determine total filtration of an x ray unit
- Processor quality assurance test

- Radiological protection survey of an x ray unit
- Check compatibility of safe light
- Check performance of view box
- Effect of kVp on x ray output

Radiography and processing techniques

1. Processing techniques: includes dark room and dry processing.
2. Radiography of the musculo-skeletal system including extremities.
3. Radiography of the chest, spine, abdomen and pelvic girdle.
4. Radiography of the skull, orbit, sinuses.
5. Contrast techniques and interpretation of GI tract, hepato-biliary tract, pancreas etc.
6. Contrast techniques and interpretation of the Central Nervous system.
7. Contrast techniques and interpretation of the cardiovascular system including chest.
8. Contrast techniques and interpretation of the genito - urinary system including Obstetrics and Gynaecology.
9. Paediatric radiology including MCU, genitogram, bone age.
10. Dental, portable and emergency (casualty) radiography.

TEACHING AND LEARNING METHODS

The training is spread over 3 years and includes following components:

1. Physics related to imaging
2. Rotational posting in various sub-specialties.
3. Seminars, case discussion, journal club**.**
4. Research methodology and statistics.
5. A log book should be maintained by the student and will be checked and signed regularly by the faculty-in-charge during the training program.
6. The postgraduate students shall be required to participate in the teaching and training program of undergraduate students and interns.
7. The postgraduate student would be required to present one poster presentation, to read one paper at a national/state conference and to submit one research paper which should be published or accepted for publication or sent for publication to a peer reviewed journal, during the period of his/her postgraduate studies so as to make him/her eligible to appear at the postgraduate degree examination.
7. Department should encourage e-learning activities.

Rotations:

During the three-year course, suggested rotations are as follows:-

1.	Conventional chest, abdomen, musculoskeletal including skull, spine, PNS and mammography etc	8 months
2.	Contrast studies: G.U., GIT, Hepato-biliary, angiography etc including fluoroscopic guided interventions	8 months
3.	US, Doppler and US guided interventions	8 Months
4.	CT and CT guided interventions	6 Months
5.	Emergency radiology	2 Months
6.	M.R.I.	2 Month
7.	Elective posting	2 Months

During each posting, post graduate student should be able to perform the procedures and interpret the findings.

PROPOSED SCHEDULE FOR ROTATION

1ST Year (1/6)	Conventional Chest & abdomen	Conventional skull, spine, musculo-skeletal etc.	US	Contrast studies - GIT & other fluoroscopic investigations	Contrast studies - G.U. tract	US
(2/6)	US & interventions	Conventional skull, spine, musculo-skeletal etc.	CT	Contrast studies -- GIT & other fluoroscopic investigations	Contrast studies - G.U. tract	US & interve-ntions
2nd Year (3/6)	Conventional Chest & abdomen	Contrast studies - GIT & other fluoroscopic investigations including angiography	Contrast studies - G.U. tract	US & interventions	Emergency	CT
(4/6)	Conventional skull, spine, musculo-skeletal etc.	Contrast studies - G.U. tract including pediatric MCU/genito-gram	US & interven-tions	US & Doppler	Emergency	MRI
3rd year (5/6)	Conventional Chest & mammo-graphy	Contrast studies - GIT & other fluoroscopic investigations including angiography	US & Doppler	Emergency	CT & inter-ventions	Elective
(6/6)	Conventional musculo-skeletal & mammo-graphy	Contrast studies - G.U. tract including pediatric MCU/genito-gram	CT& inter-ventions	CT & inter-ventions	MRI	Elective

During the training programme, patient safety is of paramount importance; therefore, skills are to be learnt initially on the models, later to be performed under supervision followed by performing independently. For this purpose, provision of skills laboratories in medical colleges is mandatory.

ASSESSMENT

FORMATIVE ASSESSMENT, during the training programme

Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self directed learning and ability to practice in the system.

General Principles

Internal Assessment should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills. The Internal Assessment should be conducted in theory and practical/clinical examination.

Quarterly assessment during the MD training should be based on:

1. **Journal based / recent advances learning**
2. **Patient based /Laboratory or Skill based learning**
3. **Self directed learning and teaching**
4. **Departmental and interdepartmental learning activity**
5. **External and Outreach Activities / CMEs**

The student to be assessed periodically as per categories listed in postgraduate student appraisal form (Annexure I).

SUMMATIVE ASSESSMENT, i.e., assessment at the end of training

The summative examination would be carried out as per the Rules given in **POSTGRADUATE MEDICAL EDUCATION REGULATIONS, 2000.**

Postgraduate Examination

The Post Graduate Examination was conducted in three parts.

1. **Thesis:**

   Every post graduate student shall carry out work on an assigned research project under the guidance of a recognized Post Graduate Teacher, the result of which shall be written up and submitted in the form of a Thesis (Dissertation). Work for writing the Thesis is aimed at contributing to the development of a spirit of enquiry, besides exposing the post graduate student to the techniques of research, critical analysis, acquaintance with the latest advances in medical science and the manner of identifying and consulting available literature.

   Thesis shall be submitted at least six months before the Theory and Clinical /

Practical examination. The thesis shall be examined by a minimum of two external examiners, who shall not be the examiners for Theory and Clinical examination. A post graduate student shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners.

2. Theory Examination

The examinations shall be organized on the basis of 'Grading' or 'Marking system' to evaluate and to certify post graduate student's level of knowledge, skill and competence at the end of the training. Obtaining a minimum of 50% marks in 'Theory' as well as 'Practical' separately shall be mandatory for passing examination as a whole. The examination for M.D. shall be held at the end of 3rd academic year. An academic term shall mean six month's training period**.**

There shall be four theory papers:

Paper I: Basic sciences related to Radiology (consists of Anatomy, Pathology, Basic and Radiation Physics, Imaging Techniques, and Film processing).

Paper II: Chest, CVS, CNS including Head & Neck, Eye, ENT, musculo-skeletal, pediatric radiology and Mammography.

Paper III: Abdominal Imaging including GI, GU, Hepatobiliary, endocrine and metabolic, Obstetrics and Gynaecology and Interventional radiology

Paper IV: Recent advances, nuclear medicine; Radiology related to clinical specialties

All papers would consist of short answer questions (minimum 10) covering all aspects of the course.

3. Practical/clinical and oral Examination (will include cases, spots, ultrasound procedure, physics, implements etc)

Practical Examination will have:

1. 3-4 Cases
2. Film Quiz (50 – 60 Spots)
3. To perform Ultrasound on a patient

Oral/Viva voce will include:

- Radiation Physics and quality assurance
- Implements, Catheters and contrast
- Cassettes, films, dark room, equipment
- Radiographic techniques, Radiological procedures,
- Gross pathology

Suggested Reading:

Books (latest edition)

1. Grainger & Allison's Text book of Diganostic Radiology (Churchill Livingstone)
2. Textbook of Gastrontestinal Radiology- Gore and Levine (Saunders)
3. MRI of Brain and Spine - Scott Atlas (LWW)
4. Diagnosis of Diseases of the Chest -Fraser
5. Diagnostic Imaging Series: (Amirsys, Elsevier)
   Abdominal Imaging, Orthopedics, Head and Neck, Neuroradiology, Pediatric Radiology Chest, Obstetrics, Breast
6. MRI in Orthopedics and Sport Injuries - Stoller
7. Skeletal Radiology - Greenspan
8. Abdominal-Pelvic MRI - Semelka (lWW)
9. Caffey's Pediatric Radiology
10. CTI and MRI of the whole body- John R. Haaga
11. Text Book of Radiology and imaging - Davod sulton
12. Diagnostic ultrasound - Carol C. Rumack
13. AIIMS-MAMC-PGI's Comprehensive Textbook of Diagnostic Radiology, Volumes 1, 2, 3

Journals

03-05 international Journals and 02 national (all indexed) journals

1. ~~American Journal of Roentgenology~~
2. ~~Radiology~~
3. ~~Seminars in Ultrasound, CT, MRI~~
4. ~~Radiographics~~
5. ~~Clinical Radiology~~
6. ~~British Journal of Radiology~~
7. ~~Radiological Clinics of North America~~
8. ~~Pediatric Radiology~~
9. ~~Australasian Radiology~~
10. ~~Journal of Computerized Axial Tomography~~
11. ~~Clinical Imaging~~
12. ~~MR Clinics of North America~~
13. ~~Seminars in Roentgenology~~

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Annexure I

Postgraduate Students Appraisal Form
Pre / Para /Clinical Disciplines

Name of the Department/Unit :

Name of the PG Student :

Period of Training : FROM.....TO.....

Sr. No.	PARTICULARS	Not Satisfactory	Satisfactory	More Than Satisfactory	Remarks
		1 2 3	4 5 6	7 8 9	
1.	Journal based / recent advances learning				
2.	Patient based /Laboratory or Skill based learning				
3.	Self directed learning and teaching				
4.	Departmental and interdepartmental learning activity				
5.	External and Outreach Activities / CMEs				
6.	Thesis / Research work				
7.	Log Book Maintenance				

Publications **Yes/ No**

Remarks* _____
_____
_____
_____

***REMARKS: Any significant positive or negative attributes of a postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.**

SIGNATURE OF ASSESSEE **SIGNATURE OF CONSULTANT** **SIGNATURE OF HOD**

Medical Council of India

NATIONAL MEDICAL COMMISSION
Postgraduate Medical Education Board

D 11011/1/22/AC/Guidelines/17 **Date: 29-08-2022**

National Medical Commission

GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR MS IN ORTHOPEDICS

GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR MS IN ORTHOPAEDICS

Preamble

Competency based training programme in Orthopaedics aims to create postgraduate student who, after undergoing the requisite training, should be able to serve the needs of the community and should be competent to solve the problems pertaining to the speciality of Orthopaedics and Trauma.

A postgraduate undergoing training MS in Orthopaedics should be trained to identify and recognize various congenital, developmental, inflammatory, infective, traumatic, metabolic, neuromuscular, degenerative and oncologic disorders of the musculoskeletal system. She/he should be able to provide competent professional services to trauma and orthopaedic patients at a primary/ secondary/tertiary healthcare centres. The PG should acquire knowledge, skill and attitude to provide healthcare and education to the patients and students.

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The purpose of this document is to provide teachers and learners illustrative guidelines to achieve defined outcomes through learning and assessment. This document was prepared by subject-content specialists. The Expert Group of the NMC had attempted to render uniformity without compromise to the purpose and content of the document. Compromise in purity of syntax has been made in order to preserve the purpose and content. This has necessitated retention of "domains of learning" under the heading "competencies.

In order to achieve sustainable outcomes, certain competencies are essential to be achieved and assessed that will enable the qualified professional to perform the role in practice as an orthopaedic specialist. These roles would be to perform as a:

1. Clinical Expert
2. Professional
3. Scholar
4. Team Member

SUBJECT SPECIFIC OBJECTIVES

The goal of M.S. Orthopaedics is to produce a competent doctor who:

1. Is aware of contemporary advances & developments in medical sciences as related to Orthopaedics and Trauma.
2. Has acquired the competencies pertaining to the subject that are required to be practiced in the community and at all levels of health system.
3. Recognizes the health needs of the patient and family and carries out professional obligations in keeping with principles of the National Health Policy and professional ethics.
4. Is oriented to principles of research methodology.
5. Has acquired skills in educating medical and paramedical professionals.
6. Has acquired skills in effectively communicating with the person, family and the community.

There is need of competency based learning. Core competencies are the essential knowledge, values and skills vital to the successful performance of effective practice of Orthopaedic and Trauma care on patients. Competence-based training is distinctly different from traditional teaching process. Competence-based training focuses on learning by doing.

Competence in medicine has been defined as "the habitual and judicious use of communication, knowledge, technical skills, clinical reasoning, emotions, values, and reflection in daily practice for the benefit of the individuals and communities being served". Competence is not an achievement but rather a habit of lifelong learning.

Ideally, the assessment of competence (what the student or physician is able to do) should provide insight into actual performance (what he or she does habitually when not observed), as a well as the capacity to adapt to change, find and generate new knowledge, and improve overall performance. The specific learning objectives based on core competence are common to all specialities. As an example of designing learning objectives in the seven domains of core competence are described below:

1. Professionalism
2. Patient care
3. Medical Knowledge
4. Practice-based learning and improvement
5. Interpersonal and Communication skills
6. Systems-based practice
7. Academic skills

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The **Goal** of the MS Orthopedics course is to train a doctor to become a competent teacher, surgeon and researcher in who has acquired competence / skills as given below:

1. Professionalism

1.1 Accepts personal responsibility for care of one's patients, consistent with good work ethics and empathy.

1.2 Demonstrates appropriate truthfulness and honesty with colleagues.

1.3 Recognizes personal beliefs, prejudices, and limitations. His / her personal beliefs and prejudices should not come in the way of providing service.

1.5 Respects patient confidentiality at all times in verbal and written communication with others.

2. Patient Care

2.1 History of and physical examination

2.1.1 Demonstrates ability to obtain a comprehensive and focused history of illness from patient/relatives.

2.1.2 Demonstrates ability to perform a comprehensive and problem-focused physical examination of the concerned human organ.

2.2 Information Management

2.2.1 Demonstrates mastery of the traditional organization of medical data in oral and written presentations.

2.2.2 Demonstrates use and interpretation of diagnostic procedures and data.

2.2.3 Demonstrate ability to use information to produce evidence for the diagnosis and treatment of relevant disease condition/s.

2.3 Procedural

2.3.1 Demonstrates mastery of adequate medical record keeping.

2.3.2 Demonstrates knowledge of accessing data and information systems.

2.3.3 Demonstrates the ability to perform a specific set of procedures identified by the faculty.

3. Medical Knowledge

3.1 Core Discipline

3.1.1 Competencies unique to the discipline,

3.1.2 Competencies derived from the clinical, pre-clinical and para-clinical disciplines.

3.2 Problem Solving

3.2.1 Demonstrates the ability to identify and find information relevant to a clinical problem, using consultation, texts, and the archival literature and electronic media.

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3.2.2 Demonstrates the ability to generate an initial list of differential diagnoses given a specific chief complaint and patient characteristics.

3.2.3 Demonstrates the ability to re-rank the differential diagnoses based on information gathered from the history, physical, and auxiliary studies (investigations).

3.2.4 Demonstrates the ability to explain a mechanism for each aspect of a patient's problem, including biological, behavioural, and social aspects.

3.2.5 Demonstrates the ability to evaluate scientific / clinical information and critically analyze conflicting data and hypotheses.

3.2.6 Demonstrates an ability to counsel a patient providing an option of treatment, conservative or operative.

4. Practice-Based Learning and Improvement

4.1 Physician Scholar

4.1.1 Demonstrates the ability to analyze the quality and implications of medical literature and apply new knowledge in the delivery of health care.

4.1.2 Demonstrates an interest and ability to identify future areas of inquiry in medical research.

4.1.3 Demonstrates enthusiasm and positive attitude in the educational process and participates fully in educational activities.

5. Interpersonal and Communication Skills

5.1 Human Relationships

5.1.1 Demonstrates knowledge of or appropriate inquiry about family and support systems.

5.1.2 Demonstrates an effective system for identifying and addressing ethical, cultural, and spiritual issues associated with health care delivery.

5.1.3 Demonstrates knowledge or applies an understanding of psychological, social, and economic factors which are pertinent to the delivery of health care.

5.1.4 Accurately assesses a patient's exportations and assumptions in accessing the health care system.

5.1.5 Effectively engages the patient and / or family in verbal communications and counselling.

6. System – Based Practice

6.1 Health Care Management

6.1.1 Demonstrates a practical, efficient and cost effective approach to diagnosis and treatment planning and recognizes its social and economic impact.

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6.1.2 Demonstrates the ability to engage the patient family in diagnosis and therapeutic treatment planning.

6.1.3 Demonstrates the ability to recognize and outline initial treatment for patient with life threatening emergencies regardless of aetiology.

6.1.4 Demonstrates knowledge of alternative medicine options and understands their role in health care delivery (AYUSH).

6.2 Health Service Delivery

6.2.1 Demonstrates knowledge of health care financing and applies it in assisting patient to access the best possible care.

6.2.2 Utilizes knowledge of population-based and evidence-based medicine in making patient management decisions.

6.2.3 Utilizes knowledge of managed care systems in making patient treatment plans and health care maintenance plans.

6.3 Health Care Team approach to health care delivery.

6.3.1 Demonstrates an understanding of the roles and competencies of other health care providers.

6.3.2 Demonstrates the ability to engage other health care professionals.

6.3.3 Demonstrates the ability to follow and lead in a team approach to health care delivery.

7. Academic Skills (Scholarly activity)

7.1 Familiarity with basic research methodology, epidemiology, basic information technology skills.

7.2 Planning the protocol of a thesis, its execution and final report.

7.3 Skills to review of relevant literature and asking relevant research question with hypothesis development.

7.4 Conducting clinical sessions for undergraduate medical students, nurses and paramedical workers.

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SUBJECT SPECIFIC COMPETENCIES

1. **Predominant in cognitive domain**:

1.1. Describe the principles of injury and its mechanism and mode, its clinical presentation, plan appropriate investigations and interpret the results, and institute the management of musculoskeletally injured patient, different forces resulting in fractures, biomechanical principles of fracture fixation.

1.2. Identify and describe the surface anatomy and relationship within of the various bones, joints, ligaments, major arteries, veins and nerves of the musculoskeletal system of the spine, upper limb, lower limb and the pelvis, chest, abdomen and head & neck. Identify structural peculiarities of specific bony components and structural speciality of clinical importance during fixation.

1.3. Define and describe the pathophysiology of shock (circulatory failure), types of shock and principles of management.

1.4. Define and describe, types of respiratory failure, the pathophysiology of respiratory failure and management.

1.5. Describe the principles and stages of bone and soft tissue healing, types of bone healing and different intrinsic and extrinsic factors which influence fracture healing.

1.6. Understand and describe the metabolic, nutritional, endocrine, and social impact of trauma, critical illness and biomechanical principles involved in each.

1.7. Enumerate, classify and describe the various bony/soft tissue injuries affecting the axial and appendicular skeletal system in adults and children.

1.8. Describe the principles of internal and external fixation for stabilization of bone and joint injuries.

1.9. Describe the mechanism of homeostasis, fibrinolysis and methods to control haemorrhage and rationale for each management.

1.10. Describe the physiological coagulation cascade and its abnormalities.

1.11. Describe different techniques of pain management as well as recovery of function in specific disease and trauma scenario.

1.12. Describe the pharmacokinetics and pharmacodynamics of drug metabolism and excretion of analgesics, anti-inflammatory agents, antibiotics, disease - modifying agents and chemotherapeutic agents and biologicals.

1.13. Understand the principles of Early Total Care and Damage Control Orthopaedics and planning of definitive orthopaedic management.

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1.14. Understand the principles of biostatistics and research methodology.

1.15. Understand the principles of Angiography, CT/MR angiography, Doppler Ultrasound, Sinogram.

1.16. Acquire the ability to order investigations.

2. Describe the clinical presentation, plan investigations, interpret results and institute steps for the management and prevention of the following disease conditions:
   2.1. Nutritional deficiency diseases affecting the bones and joints,
   2.2. Depositional arthropathies,
   2.3. Endocrine abnormalities of the musculoskeletal system,
   2.4. Metabolic abnormalities of the musculoskeletal system,
   2.5. Congenital anomalies of the musculoskeletal system,
   2.6. Developmental skeletal disorder of the musculoskeletal system,
   2.7. Bone and soft tissue tumours affecting the musculoskeletal system.

3. Describe the pathogenesis and clinical features of the following conditions in adults and children, plan appropriate investigations, interpret the results and institute appropriate management of:
   3.1. Tubercular infections of bone and joints (musculoskeletal system),
   3.2. Pyogenic infections of musculoskeletal system,
   3.3. Mycotic infections of musculoskeletal system,
   3.4. Autoimmune disorders of the musculoskeletal system (HIV),
   3.5. Rheumatoid arthropathy, Ankylosing spondylitis, seronegative arthropathy.
      3.5.1. Osteoarthrosis and spondylosis

4. Describe the pathogenesis and clinical presentation, plan and interpret results of investigations and institute appropriate treatment in the following conditions:
   4.1. Post-polio residual paralysis
   4.2. Cerebral palsy
   4.3. Muscular dystrophies and myopathies
   4.4. Nerve injuries
   4.5. Entrapment neuropathies
   4.6. Spinal dysraphism
   4.7. Spinal anomalies.

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5. Diagnose musculoskeletal manifestation of AIDS and HIV infection and its management.
6. Describe the aetiopathogenesis and clinical presentation, plan and interpret results of investigations and institute appropriate treatment for the management of osteonecrosis of bones.
7. Identify situations requiring rehabilitation services, prescribe suitable orthotic and prosthetic appliances and act as a member of the team providing rehabilitation care.
8. Identify and manage emergency situation in disorders of the musculoskeletal system.
9. Understand the basics of diagnostic imaging in orthopaedics like how and when to order and how to interpret the results of:
    9.1. Plain x-ray
    9.2. Ultrasonography
    9.3. Computerised axial tomography
    9.4. Magnetic resonance imaging
    9.5. PET scan
    9.6. Radio Isotope bone scan
    9.7. Digital Subtraction Angiography (DSA)
    9.8. Dual energy x-ray Absorptiometry
    9.9. Arthrography.
10. Describe the aetiopathogenesis, clinical presentation, identification, plan investigation/s and institute appropriate treatment for oncologic problems of musculoskeletal system (both benign and malignant: primary and secondary).
11. Understand the basics and principles of biomaterials and orthopaedic metallurgy.
12. Describe the principles of normal and abnormal gait and understand the biomedical principles of posture and replacement surgeries.
13. Describe social, economic, environmental, biological and emotional determinants of health in a given patient with a musculoskeletal problem.
14. Identify a research problem, prepare a research protocol, conduct a study, record observations, analyse data, interpret the results, discuss and disseminate the findings

II. Predominant in the Psychomotor domain

1. At the end of the first year of M.S. Orthopaedics programme, the student should be able to:

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1.1. Elicit a clinical history from a patient, do a physical examination, document in a case record, order appropriate investigations and make a clinical diagnosis. (Records of all competencies achieved should be documented in log book/E-Portfolio)

1.2. Impart wound care, where applicable, including different types of wound, and different chemotherapeutic agents for wound care, including VAC application and its care, and local antibiotic delivery system.

1.3. Apply all types of POP casts/slabs, splints and tractions as per need. Learn different types of bandaging.

1.4. Identify shock and provide resuscitation.

1.5. Perform aspiration of joints and local infiltration of appropriate drugs.

1.6. Perform appropriate wound debridement.

1.7. Perform arthrotomy of knee joint and also assist in arthrotomy of hip, anklet and shoulder.

1.8. Perform incision and drainage of abscess.

1.9. Perform split thickness skin grafting.

1.10. Perform fasciotomies.

1.11. Apply external fixators.

1.12. Apply skeletal tractions including skull tongs.

1.13. Triage a disaster situation and multiple trauma patients in an emergency room.

1.14. Perform on bone models, interfragmentary compression screws, external fixation, Tension band wiring and Broad plating.

1.15. Perform closed reduction of common dislocations like shoulder and common fractures like collar fracture, supracondylar fracture.

1.16. Perform on a cadaver standard surgical approaches to the musculo-skeletal system.

2. At the end of the second year of M.S. Orthopaedics course, the student should be able to:

2.1. Take an informed consent for standard orthopaedic procedures.

2.2. Perform closed/open biopsies for lesions of bone, joints and soft tissues.

2.3. Perform split thickness skin grafting and local flaps.

2.4. Perform on bone models, internal fixation with k-wires, screws, plates, Dynamic hip/condylar screws/nailing.

2.5. Perform sequestrectomy and saucerisation.

2.6. Perform arthrotomy of joints like hip/shoulder, ankle, elbow.

2.7. Perform repair of open hand injuries including tendon repair.

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2.8. Perform arthodesis of small joints.

2.9. Perform diagnostic arthroscopy on models and their patients.

2.10. Perform carpal tunnel/tarsal tunnel release.

2.11. Apply Ilizarov external fixator.

2.12. Perform soft tissue releases in contractures, tendon lengthening and correction of deformities.

2.13. Perform amputations at different levels.

2.14. Perform corrective surgeries for Congenital talipes equino-varus (CTEV), DDH, Perthes/ skeletal dysplasia.

2.15. Perform cadaver based procedures, arthroscopy, arthrotomy.

3. At the end of the third year of M.S. Orthopaedics programme, the student should be able to:

3.1. Assist in the surgical management of poly trauma patient.

3.2. Assist in Arthroplasty surgeries of hip, knee, shoulder and the ankle.

3.3. Assist in spinal decompressions and spinal stabilizations.

3.4. Assist in operative arthroscopy of various joints.

3.5. Assist /perform arthrodesis of major joints like hip, knee, shoulder, elbow.

3.6. Assist in corrective osteotomies around the hip, pelvis, knee, elbow, finger and toes.

3.7. Assist in surgical operations on benign and malignant musculoskeletal tumour including radical excision and custom prosthesis replacement.

3.8. Assist in open reduction and internal fixations of complex fractures of acetabulam, pelvis, IPSI lateral floating knee/elbow injuries, shoulder girdle and hand.

3.9. Assist in spinal deformity corrections.

3.10. Independently perform closed/open reduction and internal fixation with DCP, LCP, intra- medullary nailing, LRS.

3.11. Assist in limb lengthening procedures.

3.12. Assist in revision surgeries.

3.13. Provide pre- and post- OP care. This care should be exercised from first year.

3.14. Perform all clinical skills as related to the speciality.

III. Predominant in Affective Domain:

1. Should be able to function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the patient and the clinician or other colleagues to provide the best possible diagnosis or opinion.

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1.1. Always adopt ethical principles and maintain proper etiquette in dealings with patients, relatives and other health personnel and to respect the rights of the patient including the right to information and second opinion.

1.2. Develop communication skills to word reports and professional opinion as well as to interact with patients, relatives, peers and paramedical staff, and for effective teaching.

IV. Attitudes including Communication skills and Professionalism

1. Communication skills: The PG student should:

1.1. Exhibit participation in honest, accurate health related information sharing in a sensitive and suitable manner.

1.2. Recognize that being a good communicator is essential to practice effectively.

1.3. Exhibit effective and sensitive listening skills.

1.4. Recognise the importance and timing of breaking bad news and know how to communicate.

1.5. Exhibit participation in discussion of emotional issues.

1.6. Exhibit leadership in handling complex and advanced communication.

1.7. Recognize the importance of patient confidentiality and the conflict between confidentiality and disclosure.

1.8. Be able to establish rapport in therapeutic bonding with patients, relatives and other stakeholders through appropriate communication.

1.9. Able to obtain comprehensive and relevant history from patients/relatives.

1.10. Able to counsel patients on their condition and needs. Add counselling of diagnosis, prognosis, complications as well as planning for the management.

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2. **Team work**: Seek cooperation. Coordination and communication among treating specialties and paramedical staff.
3. **Counselling of relatives**: regarding patient's condition, seriousness, bereavement and counselling for organ donation in case of brain stem death.
4. **Leadership**: Trauma prevention, education of the public, paramedical and medical persons.
5. **Advocacy**: with the government and other agencies towards cause of trauma care.
6. **Ethics**: The Code of Medical Ethics as proposed by National Medical Commission of India will be learnt and observed.

SUBJECT SPECIFIC PRACTICE-BASED OR PRACTICAL COMPETENCIES

Name/ Description of practice based competencies	Expected quantum
1. Taking a Clinical History from a patient with appropriate physical exam a. Hip-pain, Limp, Deformity, Instability, Both in child and adult b. Knee-pain, Deformity, Instability in child and adult c. Ankle, Foot d. Shoulder e. Elbow f. Wrist g. Head h. Spine	At least 3 clinical encounters in each region
2. In the Bone Skills Lab **Basic** 1. Introduction and tension band wiring 2. Lag screw interfragmentary compression 3. Broad plating 4. Narrow plating 5. Ex-Fix 6. Cancellous screw fixation 7. Umex **Intermediary** 1. DHS 2. DCS 3. Tibia nailing 4. Femur nailing 5. Tibia condyle 6. Elbow 7. Ankle **Advanced:** 1. Pelvis 2. Pubic symphysis 3. Acetabulum 4. MIPPO 5. Hemiarthroplasty 6. Spine posterior 7. Spine anterior	Practice at least twice on bone models and record

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3. On Patients i. **At the end of the first year of M.S. Orthopaedics programme, the student will be able to perform:** a. Wound care - different types of wound, and different chemotherapeutic agents for wound care, including VAC application b. POP casts/slabs, splints and tractions as per need. Learning of different types of bandaging. c. Identify shock and provide resuscitation d. Aspiration of joints and infiltration of appropriate drugs e. wound debridement f. Arthrotomy of knee joint and assist in arthrotomy of Hip, anklet, shoulder. g. Incision and drainage of abscess h. Split thickness skin grafting i. Fasciotomes j. External fixators k. Skeletal tractions including skull tongs l. Triage a disaster situation and multiple trauma patients in an emergency room m. Perform on bone models, interfragmentary compression screws, external fixation, Tension band wiring and Broad plating n. Closed reduction of common dislocations like shoulder and common fractures like collar fracture, supracondylar fracture. o. Perform on a cadaver standard surgical approaches to the musculo skeletal system. **ii. At the end of the second year of M.S. Orthopaedics course, the student should be able to:** a. Perform closed/open biopsies for lesions of bone, joints and soft tissues b. Perform split thickness skin grafting and local flaps	As per the clinical volume available in each institution

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c. Perform on bone models, internal fixation with k-wires, screws, plates. Dynamic hip/condylar screws/nailing. d. Perform sequestrectomy and saucerisation e. Perform arthrotomy of joints like hip/shoulder, ankle, elbow f. Perform repair of open hand injuries including tendon repair g. Perform arthodesis of small joints h. Perform diagnostic arthroscopy on models and their patients i. Perform carpal tunnel/tarsal tunnel release j. Apply ilizarov external fixator k. Perform soft tissue releases in contractures, tendon lengthening and correction of deformities l. Perform amputations at different levels m. Perform corrective surgeries for CTEV, DDH, perthes/ skeletal dysplasia n. Perform cadaver based procedures, Arthroscopy, Arthrotomy.	As per the clinical volume available in each institution
iii. At the end of the third year of M.S. Orthopaedics programme, the student should be able to: a. Assist in the surgical management of poly trauma patient b. Assist in Arthroplasty surgeries of hip, knee, shoulder and the ankle c. Assist in spinal decompressions and spinal stabilizations d. Assist in operative arthroscopy of various joints e. Assist /perform arthrodesis of major joints like hip, knee, shoulder, elbow f. Assist in corrective osteotomies around the hip, pelvis, knee, elbow, finger and toes g. Assist in surgical operations on benign and malignant musculoskeletal tumour including radical excision and custom prosthesis replacement. h. Assist in open reduction and internal fixations of complex fractures of acetabulam, pelvis, IPSI lateral floating knee/elbow injuries, shoulder girdle and hand i. Assist in spinal deformity corrections	As per the clinical volume available in each institution

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j. Independently perform closed/open reduction and internal fixation with DCP, LCP, intra meduallary nailing, LRS k. Assist in limb lengthening procedures l. Assist in Revision surgeries m. Provide pre and post OP care This care should be exercised from first year n. Perform all clinical skills as related to the speciality.	

SYLLABUS

I. COGNITIVE DOMAIN

At the end of the M.S. Orthopaedics programme, the post graduate student should be competent and show sufficient understanding of Basic Sciences as applicable to Orthopaedics and Trauma through a problem based approach.

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1. Basic Sciences as related to Orthopaedics and Trauma

a) Embryogenesis of all organ systems
b) Structure and function of Central Nervous System
c) Structure and function of the peripheral Nervous System
d) Structure and function of the arterial and venous system
e) Structure and functions of the head & neck, abdomen, thorax and extremities.

2. Physiological basis and Pathophysiology in Health and Disease

a) Physical Growth
b) Temperature regulation
c) Acid Base Balance
d) Fluid Balance
e) Hematopoiesis
f) Hemostasis
g) Electrolyte balance
h) Bone mineralization: Calcium-Phosphate balance
i) Renal functions

j) Hepatic function
k) Respiratory functions
l) Cardiac functions
m) Gastrointestinal functions
n) Endocrine functions
o) Developmental Milestones
p) Nutritional Needs of Orthopaedic/Trauma Patients
q) Allergy

3. **Clinical Microbiology as related to Orthopaedic infections**
   a) Virology
   b) Bacteriology
   c) Mycology
   d) Parasitology (Protozoology and Helminthology)
   e) Waste disposal, Sterilization, Disinfection

4. Clinical Pharmacology as related to Orthopaedics & Trauma
   a) Pharmacokinetics – of common medications used in Orthopaedics & Trauma
   b) Antimicrobials
   c) Analgesia, Sedation
   d) Drug Interactions
   e) Adverse effects
   f) Antidotes for Poisons
   g) Drug induced disease

5. **Professionalism and Ethics**
   a) Professionalism
   b) Ethics
   c) Medico legal essentials

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6. **Wound healing principles**
    a) Types of wounds
    b) Stages of wound healing
    c) Biochemical & Molecular factors in wound healing
    d) Chemotherapeutic and other Pharmaceuticals in wound care
    e) Host, Environment and agent factors
7. **Bone Healing**
    a) Principles of bone healing
    b) Biological bone healing
    c) Factors influencing bone healing
    d) Biomechanism of bone healing

TEACHING AND LEARNING METHODS

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General principles

Acquisition of competencies being the keystone of doctoral medical education, such training should be skills oriented. Learning in the program, essentially autonomous and self-directed, and emanating from academic and clinical work, shall also include assisted learning. The formal sessions are meant to supplement this core effort.

All students joining the postgraduate (PG) courses shall work as full-time (junior) residents during the period of training, attending not less than 80% of the training activity during the calendar year, and participating in all assignments and facets of the educational process. They shall maintain a log book for recording the training they have undergone, and details of the procedures done during laboratory and clinical postings in real time.

Teaching-Learning methods

This should include a judicious mix of demonstrations, symposia, journal clubs, clinical meetings, seminars, small group discussion, bed-side teaching, case-based learning, simulation-based teaching, self-directed learning, integrated learning, interdepartmental meetings and any other collaborative activity with the allied departments. Methods with exposure to the applied aspects of the subject relevant to basic/clinical sciences should also be used. **The suggested examples of teaching-learning methods are given below but are not limited to these. The frequency of various below mentioned teaching-learning methods**

can vary based on the subject's requirements, competencies, work load and overall working schedule in the concerned subject.

A. Lectures: Didactic lectures should be used sparingly. A minimum of 10 lectures per year in the concerned PG department is suggested. Topics to be selected would be as per subject requirements. All postgraduate trainees will be required to attend these lectures. Lectures can cover topics such as:

1. Subject related important topics as per specialty requirement
2. Recent advances
3. Research methodology and biostatistics
4. **Salient features of Undergraduate/Postgraduate medical curriculum**
5. Teaching and assessment methodology.

Topic numbers 3, 4, 5 can be done during research methodology/biostatistics and medical education workshops in the institute.

B 1. Journal club: Minimum of twice a month is suggested.

Topics will include presentation and critical appraisal of original research papers published in peer reviewed indexed journals. The presenter(s) shall be assessed by faculty and grades recorded in the logbook.

B 2. ORTHO RADIOLOGY MEETS: Twice a month discussions amongst Ortho & Radiology Residents under facilitation of faculty on various imaging modalities used and its interpretation.

B.3. ORTHO SURGICAL PATHOLOGICAL MEET: Special emphasis on the surgical pathology radiological aspect of the case in the pathology department. Clinician (Ortho resident) presents the clinical details of the case, radiology PG student describes the Radiological findings and its interpretation and Pathology student describes the morbid anatomy and histopathology of the same case.

B. 4. SKILLS LAB SESSIONS: Once a fortnight for first 2 years.

C. Student Seminar: Minimum of twice a month is suggested.

Important topics should be selected as per subject requirements and allotted for in-depth study by a postgraduate student. A teacher should be allocated for each seminar as faculty moderator to help the student prepare the topic well. It should aim at comprehensive evidence-based review of the topic. The student should be graded by the faculty and peers.

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D. Student Symposium: Minimum of once every 3 months.

A broad topic of significance should be selected, and each part shall be dealt by one postgraduate student. A teacher moderator should be allocated for each symposium and moderator should track the growth of students. The symposium should aim at an evidence-based exhaustive review of the topic. All participating postgraduates should be graded by the faculty and peers.

E. Laboratory work / Bedside clinics/case presentation: Case presentation once a week in the ward, outpatient department/special clinics.

Laboratory work/Clinics/bedside teaching should be coordinated and guided by faculty from the department. Various methods like DOAP (Demonstrate, Observe, Assist, Perform), simulations in skill lab, and case-based discussions etc. are to be used. Faculty from the department should participate in moderating the teaching-learning sessions during clinical rounds.

F. Interdepartmental colloquium

Faculty and students must attend monthly meetings between the main Department and other department/s on topics of current/common interest or clinical cases; eg., combined clinical round with Radiology, Pathology etc.

G. a. Rotational clinical / community / institutional postings

Depending on local institutional policy and the subject specialty needs, postgraduate trainees may be posted in relevant departments/ units/ institutions. The aim would be to acquire more in-depth knowledge as applicable to the concerned specialty. Postings would be rotated between various units/departments and details to be included in the specialty-based Guidelines. Few examples are listed below:

1. Clinical postings

A major portion of posting should be in Orthopaedics department. It should include in-patients, out-patients, ICU, trauma, emergency room and speciality clinics.

Rotation of posting

- Inter-unit rotation in the department should be done for a period of up to one year.
- Rotation in appropriate related subspecialties for a total period not exceeding 06 months.

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- Medical Education Unit (MEU) or Department of Medical Education (DOME) (optional)

T/L Education

- Bone Skills Lab sessions – Twice a week
- Surgical Audit sessions – Once every week
- Cadaver based education – Twice a month
- Web based e-learning sessions – Once a fortnight
- Simulated environment learning – Two sessions in a week
- **Mortality & Morbidity meetings with SURGICAL AUDIT:** Once a month

G b. Posting under "District Residency Programme" (DRP):

All postgraduate students pursuing MS/MS in broad specialities in all Medical Colleges/Institutions shall undergo a compulsory rotation of three months in District Hospitals/District Health System as a part of the course curriculum, as per the Postgraduate Medical Education (Amendment) Regulations (2020). Such rotation shall take place in the 3rd or 4th or 5th semester of the Postgraduate programme and the rotation shall be termed as "District Residency Programme" and the PG medical student undergoing training shall be termed as "District Resident".

Every posting should have its defined learning objectives. It is recommended that the departments draw up objectives and guidelines for every posting offered in conjunction with the collaborating department/s or unit/s. This will ensure that students acquire expected competencies and are not considered as an additional helping hand for the department / unit in which they are posted. The PG student must be tagged along with those of other relevant departments for bedside case discussion/basic science exercises as needed, under the guidance of an assigned faculty.

Opportunities to present and discuss infectious disease cases through bedside discussion and ward/grand rounds with specialists / clinicians in different hospital settings must be scheduled to address antimicrobial resistance issues and strategies to deal with it.

H. Teaching research skills

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Writing a thesis should be used for inculcating research knowledge and skills. All postgraduate students shall conduct a research project of sufficient depth to be presented to the University as a postgraduate thesis under the supervision of an eligible faculty member of the department as guide and one or more co-guides who may be from the same or other departments.

In addition to the thesis project, every postgraduate trainee shall participate in at least one additional research project that may be started or already ongoing in the department. It is preferable that this project will be in an area different from the thesis work. For instance, if a clinical research project is taken up as thesis work, the additional project may deal with community/field/laboratory work. Diversity of knowledge and skills can thereby be reinforced.

I. Training in teaching skills

MEU/DOME should train PG students in education methodologies and assessment techniques. The PG students shall conduct UG classes in various courses and a faculty shall observe and provide feedback on the teaching skills of the student.

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J. Log book

During the training period, the postgraduate student should maintain a Log Book indicating the duration of the postings/work done in Wards, OPDs, Casualty and other areas of posting. This should indicate the procedures assisted and performed and the teaching sessions attended. The log book entries must be done in real time. The log book is thus a record of various activities by the student like: (1) Overall participation & performance, (2) attendance, (3) participation in sessions, (4) record of completion of pre-determined activities, and (5) acquisition of selected competencies.

The purpose of the Log Book is to:

a) help maintain a record of the work done during training,
b) enable Faculty/Consultants to have direct information about the work done and intervene, if necessary,
c) provide feedback and assess the progress of learning with experience gained periodically.

The Log Book should be used in the internal assessment of the student, should be checked and assessed periodically by the faculty members imparting the training. The PG students will be required to produce completed log book in original at the time of final practical examination. It should be signed by the Head of the Department. A proficiency certificate from the Head of Department regarding the clinical competence and skillful performance of procedures by the student will be submitted by the PG student at the time of the examination.

The PG students shall be trained to reflect and record their reflections in log book particularly of the critical incidents. Components of good teaching practices must be assessed in all academic activity conducted by the PG student and at least two sessions dedicated for assessment of teaching skills must be conducted every year of the PG program. The teaching faculty are referred to the MCI Logbook Guidelines uploaded on the Website.

K. **Course in Research Methodology**: All postgraduate students shall complete an online course in Research Methodology within six months of the commencement of the batch and generate the online certificate on successful completion of the course.

Other aspects

- The Postgraduate trainees must participate in the teaching and training program of undergraduate students and interns attending the department.
- Trainees shall attend accredited scientific meetings (CME, symposia, and conferences) at least once a year.
- Department shall encourage e-learning activities.
- The Postgraduate trainees should undergo training in Basic Cardiac Life Support (BCLS) and Advanced Cardiac Life Support (ACLS).
- The Postgraduate trainees must undergo training in information technology and use of computers.

During the training program, patient safety is of paramount importance; therefore, relevant clinical skills are to be learnt initially on the models, later to be performed under supervision followed by independent performance. For this purpose, provision of skills laboratories in medical colleges is mandatory.

ASSESSMENT

FORMATIVE ASSESSMENT, ie., assessment to improve learning

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Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self-directed learning and ability to practice in the system.

General Principles

Internal Assessment should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills.

The Internal Assessment should be conducted in theory and practical/clinical examination, should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills.

Quarterly assessment during the MS training should be based on:

1. Journal based / recent advances learning
2. Patient based /Laboratory or Skill based learning
3. Self-directed learning and teaching
4. Departmental and interdepartmental learning activity
5. External and Outreach Activities / CMEs
6. Mini Cex encounter – at least 4
7. Clinical encounter cards - at least -4
8. Direct observation of procedural skills – at least 6 including Cadaver dissection
9. OSCE/Theory, Essay, Short notes
10. MCQS
11. Bone Skill Lab performance assessment

Note: These sessions may be organized and recorded as an institutional activity for all postgraduates.

- Attendance at Scientific meetings, CME programmes (at least 02 each)

The student to be assessed periodically as per categories listed in the student appraisal form (Annexure I).

SUMMATIVE ASSESSMENT, ie., assessment at the end of training

Essential pre-requisites for appearing for examination include:

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1. **Log book** of work done during the training period including rotation postings, departmental presentations, and internal assessment reports should be submitted.

2. At least **two presentations** at national level conference. One research paper should be published / accepted in an indexed journal**. (It is suggested that the local or University Review committee assess the work sent for publication).**

The summative examination would be carried out as per the Rules given in the latest POSTGRADUATE MEDICAL EDUCATION REGULATIONS. The theory examination shall be held in advance before the Clinical and Practical examination, so that the answer books can be assessed and evaluated before the commencement of the clinical/Practical and Oral examination**.**

The postgraduate examination shall be in three parts**:**

1. **Thesis**

   Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination. The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination. A post graduate student in broad specialty shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners**.**

2. **Theory examination**

   The examinations shall be organized on the basis of 'Grading'or 'Marking system' to evaluate and to certify post graduate student's level of knowledge, skill and competence at the end of the training, as given in the latest POSTGRADUATE MEDICAL EDUCATION REGULATIONS. Obtaining a minimum of 50% marks in 'Theory' as well as 'Practical' separately shall be mandatory for passing examination as a whole. The examination for M.D./ M.S shall be held at the end of 3rd academic year.

   There shall be four theory papers (as per PG Regulations).

   Paper I: Basic sciences as applied to the subject

   Paper II: Traumatology and Rehabilitation

   Paper III: Orthopaedic diseases

   Paper IV: Recent advances in Orthopaedic surgery & General Surgery as applied to Orhopaedics

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3. Practical/clinical and Oral/viva voce examination

Practical examination

Practical examination should be spread over **two** days and include various major components of the syllabus focusing mainly on the psychomotor domain.

Oral/Viva voce examination on defined areas should be conducted by each examiner separately. Oral examination shall be comprehensive enough to test the post graduate student's overall knowledge of the subject focusing on psychomotor and affective domain. It should include:

- Stations for clinical, procedural and communication skills
- Log Book Records and reports of day-to-day observation during the training
- Should test the post graduate student's overall knowledge of the subject in:
    - Ortho Radiology
    - Ortho Pathology
    - Histopathology & Gross anatomy
    - Instruments
    - Orthotics and Prosthotics

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Recommended Reading:

1. Campbell's Operative Orthopaedics, Vols 1, 2, 3 & 4 Campbell's Operative Orthopaedics, 4-Volume Set, 14th Edition by Frederick M Azar, MD, S. Terry Canale, MD and James H. Beaty, MD
2. Mercer's Orthopaedic Surgery Vol. 1 & 2, Author(s) : Robert B Duthie Edition: Nineth, Year of Publication: 2003
3. Rockwood And Greens – Fractures in Adults, Vol 1& 2 Rockwood and Green's Fractures in Adults Author(s): Paul Tornetta , William Ricci MD, FAAOS, Charles M. Court-Brown MD, FRCS Ed (Orth), Margaret M. McQueen MD, Michael McKee MD, FRCS (C)Publication Date: March 27, 2019
4. Fractures in Children – Rockwood & Wilkins - Rockwood and Wilkins Fractures in Children Edition: 9. Author(s): Peter M Waters MD, David L. Skaggs MD, John M. Flynn. Publication Date: March 19, 2019

5. Paediatric Orthopaedics – Tachidjian, Vol 4 Tachdjian's Pediatric Orthopaedics: From the Texas Scottish Rite Hospital for Children, 6th edition - November 27, 2020 Author: John Herring
6. Concise System Of Orthopaedics And Fractures – Graham Apley Apley's Concise System of Orthopaedics and Fractures Louis Solomon, David Warwick, Selvadurai Nayagam CRC Press, 31-Mar-2005
7. Textbook of Orthopaedics and Trauma – Kulkarni, Vol 1 Textbook of Orthopedics and Trauma (4 Volumes) GS Kulkarni, Sushrut Babhulkar, Publish Year 2016
8. B.D. Chaurasia's Human Anatomy, Vol1,Vol 2, Vol 3 B D Chaurasia's Handbook of Anatomy English Editions 2022 Eighth Editions Volume 2 (paperpack, CHAURASIAS), Author: CHAURASIAS, Publisher: CBS Publishers, Publishing Date 2022
9. Pharmacology and Pharmacotherapeutics – Satoskar- Pharmacology and Pharmacotherapeutics, 24th Edition - June 30, 2015, Authors: RS Satoskar, Nirmala Rege, SD Bhandarkar
10. Orthopaedics Anatomy and Surgical Approaches Frederick Wreckling Orthopaedic Anatomy and Surgical Approaches Edited by Frederick W. Reckling, Jo Anne B. Reckling and Melvyn P. Mohn, S. P. Frostick, First Published August 1, 1991
11. Green's Operative Hand Surgery-Vol. 1&. 2, Green, David P; Hotchkiss, Robert N Green's Operative Hand Surgery, 2-Volume Set 7th Edition - February 24, 2016, Authors: Scott W. Wolfe, William C. Pederson, Scott H. Kozin, Mark S. Cohen
12. Surgical Exposures in Orthopedics: The Anatomic Approach, Hoppenfeld, Stanley; De Boer, Piet Surgical Exposures in Orthopaedics: The Anatomic Approach, Edition: 6, Author(s): Piet de Boer MD, Richard Buckley MD, FRCSC, Stanley Hoppenfeld MD, Publication Date: October 7, 2021
13. Text Book of Ilizarov Surgical Techniques Bone Correction And Lengthening, Golyakhovsky, Vladimir; Frankel, Victor H Textbook of Ilizarov Surgical Techniques: Bone Correction and Lengthening by Vladimir Golyakhovsky, Victor H Frankel, Publishing Year 2010
14. Applied Orthopaedic Biomechanics, Dutta, Santosh; Datta, Debasis Applied Orthopaedic Biomechanics, by Debasis Datta Santosh K Dutta Publisher : B.I.Publications, Year 2008.

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Journals

03-05 international Journals and 02 national (all indexed) journals.

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Annexure 1

Student appraisal form for MS in Orthopedics											
	Element	**Less than Satisfactory**			**Satisfactory**			**More than satisfactory**			**Comments**
		1	2	3	4	5	6	7	8	9	
1	**Scholastic Aptitude and Learning**										
1.1	Has Knowledge appropriate for level of training										
1.2	Participation and contribution to learning activity (e.g., Journal Club, Seminars, CME etc.)										
1.3	Conduct of research and other scholarly activity assigned (e.g Posters, publications etc.)										
1.4	Documentation of acquisition of competence (eg. Log book)										
1.5	Performance in work based assessments										
1.6	Self- directed Learning										
2	**Care of the patient**										
2.1	Ability to provide patient care appropriate to level of training										
2.2	Ability to work with other members of the health care team										
2.3	Ability to communicate appropriately and empathetically with patients families and care givers										
2.4	Ability to do procedures appropriate for the level of training and assigned role										

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2.5	Ability to record and document work accurately and appropriate for level of training										
2.6	Participation and contribution to health care quality improvement										
3	**Professional attributes**										
3.1	Responsibility and accountability										
3.2	Contribution to growth of learning of the team										
3.3	Conduct that is ethical appropriate and respectful at all times										
4	**Space for additional comments**										
5	**Disposition**										
	Has this assessment been discussed with the trainee?	Yes	No								
	If not explain										
	Name and Signature of the assesse										
	Name and Signature of the assessor										
	Date										

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Subject Expert Group members for preparation of REVISED Guidelines for competency based postgraduate training programme for MS in Orthopaedics

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GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR MS IN OTORHINOLARYGOLOGY

Preamble:

The purpose of PG education is to create specialists who would provide high quality health care and advance the cause of science through research & training.

The purpose of MS ENT is to standardize Otorhinolaryngology teaching at Post Graduate level throughout the country so that it will benefit in achieving uniformity in undergraduate teaching as well and resultantly creating competent ENT Surgeons with appropriate expertise.

The purpose of this document is to provide teachers and learners illustrative guidelines to achieve defined outcomes through learning and assessment. This document was prepared by various subject-content specialists. The Reconciliation Board of Academic Committee has attempted to render uniformity without compromise to purpose and content of the document. Compromise in purity of syntax has been made in order to preserve the purpose and content. This has necessitated retention of “domains of learning” under the heading “competencies”.

SUBJECT SPECIFIC LEARNING OBJECTIVES

At the end of postgraduate training the student should be able to:

1. Practice his specialty ethically keeping in mind the requirement of the patient, community and people at large.
2. Demonstrate sufficient understanding of basic sciences related to his specialty and be able to integrate such knowledge in his Clinical practice.
3. Diagnose and manage majority of conditions in his specialty (clinically and with the help of relevant investigations)
4. Plan and advise measures for the promotive, preventive, curative and rehabilitative aspects of health and diseases in the specialty of ENT.
5. Should be able to demonstrate his cognitive skills in the field of ENT and its ancillary branches during the formative and summative evaluation processes.
6. Play the assigned role in the implementation of National Health Programs
7. Demonstrate competence in basic concepts of research methodology and writing thesis and research papers.
8. Develop good learning, communication and teaching skills.

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9. Demonstrate sufficient understanding of basic sciences and the clinical applications related to the specialty to be able to integrate this knowledge into Clinical practice. Acquire in-depth knowledge in the subject including recent advances.
10. Demonstrate that he is fully conversant with the latest diagnostics & therapeutics available.

SUBJECT SPECIFIC LEARNING OBJECTIVES

1. Theoretical Knowledge:

A student should have fair knowledge of basic sciences (Anatomy, Physiology, Biochemistry, Microbiology, Pathology and Pharmacology) as applied to ENT and be able to integrate such knowledge in his clinical practice. She/He should acquire in-depth knowledge of his subject including recent advances. She/He should be fully conversant with the bedside procedures (diagnostic and therapeutic) and having knowledge of latest diagnostics and therapeutics available.

2. Clinical / Practical skills:

A student should be adept at good history taking, physical examination, providing basic life support and advanced cardiac life support, common procedures like FNAC, Biopsy, aspiration from serous cavities, lumber puncture etc. She/he should be able to choose the required investigations to enhance the attitude, communication skills, including dealing with patient's relatives with the required empathy, adapt to changing trends in education, learning methods and evolving new diagnostic and therapeutic techniques in the subject of ENT.

3. Research:

She/He should know the basic concepts of research methodology, plan a research project, plan and write a thesis and should know how to use library facilities. Basic knowledge of statistics is also required. Knowledge about use of internet resources is required.

4. Teaching:

The student should learn the basic methodology of teaching and assessment and develop competence in teaching medical/paramedical students and their assessment.

SUBJECT SPECIFIC COMPETENCIES

A. Cognitive Domain

At the end of training, the student should be able to demonstrate ability to practically apply knowledge gained during training period. This would include the following:

Basic Sciences related to Otolaryngology

- Physiology- Mechanism of perception of smell and taste, mechanism of breathing and voice production, lacrimation, deglutition and salivation. Functional tests of the nose and paranasal sinuses, mechanism of cough and sneezing.
- Physics of sound, theories of hearing, mechanism of perception of sound and speech production, physiology of equilibrium and cerebral function. Physiology of brain in connection with hearing, speech, smell and phonation. Audiologic tests like audiometry, impedance, evoked potentials, OAE, Speech audiometry.
- Physiology of larynx, tracheobronchial tree and oesophagus - Histology of mucous membranes, internal ear and other associated organs and structures, nose, PNS NPx, Larynx, Tracheo-Bronchial tree, Lymphoepithetical system. Mechanism of immune system/immunology and genetics.
- Anatomy-Embryogenesis of ear, nose and throat including palate and the larynx, Oesophagus, trachea and lungs, tongue, salivary gland Head and Neck and skull base etc.
- Parapharyngeal spaces in the neck including connective tissue barriers of larynx.
- Applied anatomy of the skull bones, accessory sinuses, external, middle and inner ears, nose, PNS, nasopharynx, meninges, brain, pharynx, larynx, trachea and bronchi, lungs, pleurae, oesophagus and the mediastinum.
- Anatomy of all cranial nerves with their functions.

Principles and Practices of Otolaryngology, Audiology and Speech Pathology

- Clinical Methodology as applied to ORL HN diseases in adult and children and the accessory sinuses, diagnosis and surgical treatment of diseases of nose, throat and ear in adult and children. Prevention and treatment, infectious diseases of Otolaryngology and Head Neck region. Circulatory and nervous disturbances of the nose, throat and ear and their effects on other organs of the body. Deformities, injuries sinus infections, polyps and the tumors of the nose, and paranasal sinuses.
- Examination of the ear, deafness and allied diseases, complications of diseases of the ear. Injuries, tumors, nervous and circulatory neurological disturbances of the ear. Diagnosis and treatment of tinnitus and vertigo. Diagnosis and rehabilitation of the Hearing handicapped including, dispensing of hearing aid other vibrotatile aids.
    - Surgical pathology of Otolaryngology and Head Neck region.
    - Basic knowledge of anaesthesia as related to ENT.
    - Examination of diseases of children (Paediatric ORL) in connection with throat and larynx. Neurological and vascular disturbances. Congenital and neonatal stridor.
    - Pathology of various diseases of the larynx and throat, tracheo-bronchial tree and their causative organisms.

- Indications and various techniques of direct laryngoscopy, nasal endoscopy. Bronchoscopy and oesophagoscopy, including microlaryngoscopic procedures.
- Reading of radiograms, scans, audiograms, nystagmograms and tympanograms in connection with ENT diseases/disorders.
- Special apparatus for the diagnosis and treatment of the diseases of ear, nose and throat including audiometer, BERA, Speech analyser etc.

Recent advances in Otolaryngology and Head Neck surgery

- Recent developments in the diagnosis, pathogenesis and treatment of the ENT diseases
- The knowledge of the frontiers of the oto-laryngology and lateral skull base surgery
- Rhinoplasty, endoscopic sinus surgery, and anterior cranial fossa surgery
- Knowledge of LASERS and fibre optics
- Other methods of managing Hearing loss
- Implantable hearing aids cochlear implants
- Phonosurgery
- Etiology and Managements of sleep apnoea/snoring
- Hypophysectomy and optic nerve decompressions
- Immunotherapy and modalities of the gene therapy
- Newer techniques for Radiotherapy including, use of gamma knife for treatment of Intracranial tumors and other malignancy
- Chemotherapy of cancer

General Surgical Principles and Head-Neck Surgery

- General Surgery, Head and Neck oncology, and Medicine as applicable to the ENT disorders/diseases. Surgery of congenital deformities of nose, ear (Pinna) and trachea/oesophagus etc.
- Radiology, Imaging – computed tomography and magnetic resonance imaging, (MRI) and intervention radiology and angiography as related to ENT
- General Pathologic aspects such as wound healing and also pathology and Pathogenesis of ENT diseases, Pharmacology, molecular biology, genetics, cytology, haematology, and immunology as applicable to otolaryngology
- General Principles of faciomaxillary traumatology and neck injury
- Plastic Surgery as applicable to Otolaryngology

B. Affective Domain

1. The student will show integrity, accountability, respect, compassion and dedicated patient care. The student will demonstrate a commitment to excellence and continuous professional development.
2. The student should demonstrate a commitment to ethical principles relating to providing patient care, confidentiality of patient information and informed consent.
3. The student should show sensitivity and responsiveness to patients' culture, age, gender and disabilities.
4. The student should be able to choose the required investigations to enhance the attitude, communicative skills, including dealing with patient's relatives with the required empathy, adapt to changing trends in education, learning methods and evolving new diagnostic and therapeutic techniques in the subject of ENT.

C. Psychomotor Domain

By the end of the training, a student should be able to demonstrate his skills in:

- Taking a good history and demonstrating good examination techniques.
- arrive at a logical working diagnosis, differential diagnosis after clinical examination and order appropriate investigations keeping in mind their relevance (need based) and thereby provide appropriate care that is ethical, compassionate, responsive and cost effective and in conformation with statutory rules.
- Should be able to perform and demonstrate the practical skills in the field of ENT including the following:
    - Examination of the ear, nose and throat oral cavity examination
    - Clinico-physiological examination and evaluation of the audio-vestibulo neurological system
    - Examination of the larynx and the throat including flexible endoscopy, stroboscopy, voice analysis and the clinico-physiological examination of the speech
    - Examination of the otological and audiological system including Tuning fork testing, audiological evaluation, micro and otoendoscopy
    - Clinical and physiological evaluation of the nose and paranasal sinuses including nasal endoscopy and olfactory evaluation
    - Examination of the neck and its structures
- Should demonstrate and perform various therapeutic skills related to the speciality such as :
    - Tracheostomy
    - Anterior/ posterior nasal packing
    - Ear Packing and Syringing
    - Foreign body removal from air nose and throat

- Airway management including basic life support skills, Cardiopulmonary resuscitation, intubation, homeostasis maintenance, IV alimentation and fluid, electrolyte maintenance and principles of blood transfusion alimentation including Nasogastric feeding, gastrostomy
- Wound suturing, dressings and care of the wounds
- Basic principles of rehabilitation
- common procedures like FNAC, biopsy, aspiration from serous cavities, lumber puncture etc.

- Should understand principles of and interpret X-rays/CT/MRI, audiograms, ENG, BERA, OAE, ultrasonographic abnormalities and other diagnostic procedures in relation to the speciality
- Should have observed/performed under supervision the various surgical procedures in relation to the speciality

Syllabus

Course contents:

1. Anatomy and Physiology of Ear, Nose and Throat, Trachea and esophagus.
2. The generation and reception of speech
3. Radiographic anatomy of the ear, nose, throat and imaging.
4. Bacteriology in relation to Otorhinolaryngology
5. Allergy and rhinitis
6. Haematology in relation to Otolaryngology
7. Anaesthesia for Otolaryngology
8. Pharmacology of drugs used in ENT
9. Electrolyte, fluid balance/shock conditions
10. Use of teaching aids
11. Routine blood, urine testing
12. Preparation of slides
13. Facial nerve stimulation test
14. Audiometric tests like pure tone Audiometry, Impedance Audiometry, Free field Audiometry, Specialized tests of hearing including SISI, Tone decay, ABLB, Speech discrimination score etc.
15. Vestibular tests like caloric testing (Water and Air) stopping test, Fukuda's test,
16. Evoked response audiometry.

Ear:

1. The physical and functional examination of the ear
2. The functional and physical examination of the vestibular system.
3. Tinnitus
4. Affections of external ear
5. Repair of deformities of the external ear.

6. Congenital conditions of the middle ear cleft
7. Traumatic conductive deafness
8. Acute inflammation of the middle ear cleft
9. Non-suppurative otitis media
10. Chronic suppurative otitis media
11. Management of chronic suppurative otitis media
12. Complications of infections of middle ear.
13. Tumors of the middle ear cleft and temporal bone
14. Diseases of the otic capsule-otosclerosis
15. Diseases of the otic capsule-other diseases
16. The deaf child
17. Acoustic neuroma
18. Ototoxicity
19. Presbycusis
20. Diagnosis and management of sudden and fluctuant sensorineural hearing loss
21. Meniere's disease
22. Neurologic aspects of vertigo
23. Facial paralysis
24. Rehabilitation of adults with acquired Hearing loss-Hearing aids
25. The cochlear Implants
26. Nystagmus
27. Otoacoustic emissions

Nose:

1. Examination of the nose
2. Conditions of the external nose
3. Injuries of the facial skeleton
4. Congenital diseases of the nose
5. The nasal septum
6. Foreign bodies in the nose, rhinolith
7. Epistaxis
8. Acute chronic inflammations of the nasal cavities
9. Vasomotor rhinitis-allergic and non-allergic
10. Nasal polyposis
11. Abnormalities of smell
12. Acute sinusitis
13. Chronic sinusitis
14. Nasal Allergy/Fungal allergic sinusitis
15. Complications of acute and chronic sinusitis
16. Tumors of nose and sinuses
17. Facial pains
18. Trans-ethmoidal hypophysectomy

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19. Functional endoscopic sinus surgery (FESS)

Throat:

1. Methods of examination of the mouth and pharynx
2. Diseases of the mouth
3. Diseases of the salivary glands
4. Pharyngeal lesions associated with general diseases
5. Diseases of the tonsils and adenoids (excluding neoplasms)
6. Tumors of the pharynx
7. Hypopharyngeal diverticulum (Pharyngeal Pouch)
8. Methods of examining and larynx and tracheobronchial tree
9. Congenital diseases of the larynx
10. Laryngeal disorders in singers and other voice users
11. Neurological affections of larynx and pharynx
12. Intubation of the larynx, laryngotomy and tracheostomy
13. Cervical node dissection
14. Skin grafts in Otolaryngology and reconstructive methods including regional and distant flaps for repair of defects after excision of tumors or trauma.
15. Micro laryngeal surgery/thyroplasty

Miscellaneous and head and neck:

1. Cranial nerves
2. Raised intracranial tension-causes, diagnosis, management with particular reference to otitis hydrocephalus
3. Head injuries and I.C. Haemorrhage
4. Pituitary gland, anatomy, physiology hypo - and hyper - pituitarism, new growths.
5. Intracranial venous sinuses and their affections
5. Osteology: skull, mandible cervical and thoracic vertebral sternum
6. Cervical fascia, facial spaces in neck, retro-pharyngeal and parapharyngeal Abscesses
7. Anatomy and physiology of thyroid gland, goitre, diseases of the thyroid and carcinoma of thyroid
8. Large blood vessels in neck, thoracic duck development of major cervical and thoracic blood vessels.
9. Head and neck reconstructive surgery

Drugs used in ENT:

1. Antibiotics Antihistaminic
2. Nasal vasoconstrictors
3. Local anaesthetics
4. Corticosteroids

5. Cyto-toxic agents
6. Antibiotics
7. Radioactive isotopes
8. Antifungal agents
9. Vasopressive and other agents used in shock like states.

General:

1. Physiology of circulation, regulation of blood pressure, reactions of body to haemorrhage, patho-physiology of shock, fluid balance, blood transfusion and its hazards, fluid replacement therapy, burns
2. Agents used in shock like states

Desirable

1. The ears and nasal sinuses in the aerospace environment
2. Physiological consideration of pressure effects on the ear and sinuses in deep water diving
3. The principles of cancer immunology with particular reference to head and neck cancer
4. Principles of chemotherapy in head and neck cancer
5. Recording of nystagmus by ENG and its interpretation

Ear:

1. Traumatic lesions of the inner ear
2. Inflammatory lesions of the vestibular and auditory nerve
3. Vascular lesions of the inner ear
4. Electronystagmography
5. Skull base/Neurologic surgery

Nose:

1. Cosmetic surgery of the nose
2. Non-healing granuloma of the nose
3. Surgery of the pterygopalatine fossa
4. LASER Surgery

Throat:

1. Oesophageal conditions in the practice of ear, nose and throat surgery
2. Disorders of speech
3. Lower respiratory conditions in Otolaryngology

Miscellaneous and head and neck

1. Functional Anatomy of cerebellum and brainstem

2. Anatomy of mediastinum
3. Pleura, plural cavity, broncho-pulmonary segments and their clinical importance
4. Facial plastic surgery

TEACHING AND LEARNING METHODS

Teaching methodology

Didactic lectures are of least importance; small group discussion such as seminars, journal clubs, symposia, reviews and guest lectures should get priority for theoretical knowledge. Bedside teaching, grand rounds, structured interactive group discussions and clinical demonstrations should be the hallmark of clinical/practical learning with appropriate emphasis on e-learning. Student should have hand-on training in performing various procedures and ability to interpret various tests/investigations. Exposure to newer specialized diagnostic/therapeutic procedures concerning her/his subject should be given. Self-learning tools like assignments and case-based learning may be promoted. Exposure to newer specialized diagnostic/therapeutic procedures concerning ENT should be given.

1. **Rotations:**
    - A major portion of posting should be in ENT Department. It should include in-patients, out-patients, ICU, trauma, emergency room, specialty clinics includingVertigo Clinic, Rhinology Clinic, Otology Clinic, Cancer Clinic, Cadaveric dissection Lab, Audiology and speech therapy.
    - Inter-unit rotation in the department should be done for a period of up to one year.
    - Rotation in appropriate related subspecialties for a total period not exceeding 06 months.
2. **Clinical meetings:**
   There should be intra- and inter- departmental meetings for discussing the uncommon /interesting cases involving multiple departments.
3. **Log book:** Each student must be asked to present a specified number of cases for clinical discussion, perform procedures/tests/operations/present seminars/review articles from various journals in inter-unit/interdepartmental teaching sessions. They should be entered in a Log Book. The Log books shall be checked and assessed periodically by the faculty members imparting the training.
4. **Thesis writing and research:**
   Thesis writing is compulsory.
5. The postgraduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.
6. A postgraduate student of a postgraduate degree course in broad specialities/super specialities would be required to present one poster presentation, to read one paper at

a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.

7. The student should know the basic concepts of research methodology, plan a research project, be able to retrieve information from the library. The student should have a basic knowledge of statistics.
8. Department should encourage e-learning activities.

During the training programme, patient safety is of paramount importance; therefore, skills are to be learnt initially on the models, later to be performed under supervision followed by performing independently; for this purpose, provision of surgical skills laboratories in the medical colleges is mandatory.

ASSESSMENT

Assessment should be comprehensive & objective. It should address the stated competencies of the course. The assessment needs to be spread over the duration of the course.

FORMATIVE ASSESSMENT, i.e., assessment during the training would include: Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self directed learning and ability to practice in the system.

General Principles

Internal Assessment should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills. The Internal Assessment should be conducted in theory and clinical examination.

Quarterly assessment during the MS training should be based on following educational activities:

1. **Journal based / recent advances learning**
2. **Patient based /Laboratory or Skill based learning**
3. **Self directed learning and teaching**
4. **Departmental and interdepartmental learning activity**
5. **External and Outreach Activities / CMEs**

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The student to be assessed periodically as per categories listed in postgraduate student appraisal form (Annexure I).

SUMMATIVE ASSESSMENT ie.,at the end of the training

The summative examination would be carried out as per the Rules given in POSTGRADUATE MEDICAL EDUCATION REGULATIONS, 2000.

The examination will be in three parts:

1. **Thesis**

Every post graduate student shall carry out work on an assigned research project under the guidance of a recognised Post Graduate Teacher, the result of which shall be written up and submitted in the form of a Thesis. Work for writing the Thesis is aimed at contributing to the development of a spirit of enquiry, besides exposing the candidate to the techniques of research, critical analysis, acquaintance with the latest advances in medical science and the manner of identifying and consulting available literature.

Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination. The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination. A candidate shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners.

2. Theory

The examinations shall be organised on the basis of 'Grading'or 'Marking system' to evaluate and to certify candidate's level of knowledge, skill and competence at the end of the training. Obtaining a minimum of 50% marks in 'Theory' as well as 'Practical' separately shall be mandatory for passing examination as a whole. The examination for MS shall be held at the end of 3rd academic year. An academic term shall mean six month's training period.

Theory shall consist of four papers of 3 hours each.

Paper I: Basic Sciences related Otolaryngology

Paper II: Principles and Practices of Otolaryngology

Paper III: Recent advances in Otolaryngology and Head Neck surgery.

Paper IV: General Surgical Principles and Head-Neck Surgery.

3. Clinical / Practical and viva voce Examination

Clinical examination shall be conducted to test the knowledge, skills, attitude and competence of the post graduate students for undertaking independent work as a

specialist/teacher, for which post graduate students shall examine a minimum one long case and two short cases.

The Oral examination shall be thorough and shall aim at assessing the post graduate student's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty, which form a part of the examination.

Assessment may include Objective Structured Clinical Examination(OSCE).

Oral/Viva-voce examination needs to assess knowledge on X-rays, instrumentation, operative procedures. Due weightage should be given to Log Book Records and day-to-day observation during the training.

Recommended Reading:

Books (latest edition)

- Scott-Brown's *Otorhinolaryngology and Head and Neck Surgery*
- Cummings *Otolaryngology - Head and Neck Surgery*
- *Otolaryngology, Otology &Neurotalogy* by Paprella&Micheal
- Glasscock-Shambaugh's*Surgery of the Ear*
- *Essentials of Functional Sinus Surgery* by Heinz Stammberger MD
- *Color Atlas of Head & Neck Surgery* by Jatin P Shah
- *Handbook of Clinical Audiology*by Jack Katz
- Stell& Maran's *Textbook of Head and Neck Surgery and Oncology*

Journals

03-05 international Journals and 02 national (all indexed) journals

Annexure I

Postgraduate Students Appraisal Form
Pre / Para /Clinical Disciplines

Name of the Department/Unit :

Name of the PG Student :

Period of Training : FROM.....TO.....

Sr. No.	PARTICULARS	Not Satisfactory	Satisfactory	More Than Satisfactory	Remarks
		1 2 3	4 5 6	7 8 9	
1.	Journal based / recent advances learning				
2.	Patient based /Laboratory or Skill based learning				
3.	Self directed learning and teaching				
4.	Departmental and interdepartmental learning activity				
5.	External and Outreach Activities / CMEs				
6.	Thesis / Research work				
7.	Log Book Maintenance				

Publications **Yes/ No**

Remarks*_____
_____
_____
_____

***REMARKS: Any significant positive or negative attributesof a postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.**

SIGNATURE OF ASSESSEE **SIGNATURE OF CONSULTANT** **SIGNATURE OF HOD**

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GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR MS IN OBSTETRICS AND GYNAECOLOGY

Preamble:

The purpose of PG education is to create specialists who would provide high quality health care and advance the cause of science through research & training.

The purpose of MS Obstetrics and Gynaecology is to standardize Obstetrics & Gynaecology teaching at Post Graduate level throughout the country so that it will benefit in achieving uniformity in undergraduate teaching as well and resultantly creating competent Obstetrician and Gynaecologist with appropriate expertise.

The purpose of this document is to provide teachers and learners illustrative guidelines to achieve defined outcomes through learning and assessment. This document was prepared by various subject-content specialists. The Reconciliation Board of Academic Committee has attempted to render uniformity without compromise to purpose and content of the document. Compromise in purity of syntax has been made in order to preserve the purpose and content. This has necessitated retention of “domains of learning” under the heading “competencies”.

SUBJECT SPECIFIC LEARNING OBJECTIVES

Programme Objectives

The **goal** of the MS course in Obstetrics and Gynaecology is to produce a competent Obstetrician and Gynaecologist who can:

a. Provide quality care to the community in the diagnosis and management of Antenatal, Intra-natal and Post-natal period of normal and abnormal pregnancy and labor.
b. provide effective and adequate care to a pregnant woman with complicated pregnancy.
c. provide effective and adequate care to a normal and high risk neonate.
d. perform obstetrical ultrasound in normal and abnormal pregnancy including Doppler.
e. manage effectively all obstetrical and gynecological emergencies and if necessary make appropriate referrals.
f. provide quality care to the community in the diagnosis and management of gynaecological problems including screening, and management of all gynecological cancers including during pregnancy.

g. conduct a comprehensive evaluation of infertile couple and have a broad based knowledge of assisted reproductive techniques including – ovulation induction, *in vitro* fertilization and intra-cytoplasmic sperm injection, gamete donation, surrogacy and the legal and ethical implications of these procedures.

h. provide counseling and delivery of fertility regulation methods including reversible and irreversible contraception, emergency contraception etc.

i. provide quality care to women having spontaneous abortion or requesting Medical Termination of Pregnancy (MTP) and manage their related complications.

SUBJECT SPECIFIC COMPETENCIES

A. Cognitive Domain

At the end of the MS Course in Obstetrics and Gynaecology, the student should have acquired knowledge in the following:

- recognizes the health needs of women and adolescents and carries out professional obligations in keeping with principles of National Health Policy and professional ethics
- has acquired the competencies pertaining to Obstetrics and Gynaecology that are required to be practiced in the community and at all levels of health system
- on genetics as applicable to Obstetrics.
- on benign and malignant gynecological disorders.
- on Gynecological Endocrinology and infertility.
- on interpretation of various laboratory investigations and other diagnostic modalities in Obstetrics & Gynecology.
- on essentials of Pediatric and adolescent Gynecology.
- on care of postmenopausal women and geriatric Gynecology.
- on elementary knowledge of female breast & its diseases.
- on vital statistics in Obstetrics & Gynecology.
- Anesthesiology related to Obstetrics & Gynecology.
- Reproductive and Child Health, family welfare & reproductive tract infections.
- STD and AIDS & Government of India perspective on women's health related issues.
- Medico-legal aspects in Obstetrics & Gynecology.
- Asepsis, sterilization and disposal of medical waste.
- be able to effectively communicate with the family and the community
- is aware of the contemporary advances and developments in medical sciences as related to Obstetrics and Gynaecology.

- maintain medical records properly and know the medico-legal aspects in respect of Obstetrics & Gynecology
- Understands the difference between audit and research and how to plan a research project and demonstrate the skills to critically appraise scientific data and literature
- has acquired skills in educating medical and paramedical professionals

Ethical and Legal Issues:

The post graduate student should understand the principles and legal issues surrounding informed consent with particular awareness of the implication for the unborn child, postmortem examinations consent to surgical procedures including tubal ligation/vasectomy, parental consent and medical certification, research and teaching and properly maintain medical records.

Risk Management:

The post graduate student should demonstrate a working knowledge of the principles of risk management and their relationship to clinical governance and complaints procedures.

Confidentiality:

The post graduate student should:

- be aware of the relevant strategies to ensure confidentiality and when it might be broken.
- understand the principles of adult teaching and should be able to teach common practical procedures in Obstetrics and Gynaecology and involved in educational programme in Obstetrics and Gynaecology for medical and paramedical staff.
- be abreast with all recent advances in Obstetrics and Gynaecology and practice evidence based medicine.

Use of information technology, audits and standards:

The post graduate student should:

- acquire a full understating of all common usage of computing systems including the principles of data collection, storage, retrieval, analysis and presentation.
- understand quality improvement and management and how to perform, interpret and use of clinical audit cycles and the production and application of clinical standards, guidelines and protocols.

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- understand National Health Programmes related to Obstetrics and Gynaecology and should be aware of all the Acts and Laws related to specialty.

Health of Adolescent Girls and Post-Menopausal Women

The student should:

- Recognize the importance of good health of adolescent and postmenopausal women.
- Identification and management of health problems of post-menopausal women.
- Understanding and planning and intervention program of social, educational and health needs of adolescent girls and menopausal women.
- Education regarding rights and confidentiality of women's health, specifically related to reproductive function, sexuality, contraception and safe abortion.
- Geriatric problems.

Reproductive Tract and 'HIV' Infection

- Epidemiology of RTI and HIV infection in Indian women of reproductive age group.
- Cause, effect and management of these infections.
- HIV infections in pregnancy, its effects and management.
- Relationship of RTI and HIV with gynaecological disorders.
- Planning and implementation of preventive strategies.

Medico-legal Aspects

- Knowledge and correct application of various Acts and Laws while practicing Obstetrics and Gynaecology, particularly MTP Act and sterilization, Preconception and P.N.D.T. Act.
- Knowledge of importance of proper recording of facts about history, examination findings, investigation reports and treatment administered in all patients.
- Knowledge of steps recommended for examination and management of rape cases.
- Knowledge of steps taken in the event of death of a patient.

B. Affective domain

1. Should be able to function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the patient and the clinician or other colleagues to provide the best possible diagnosis or opinion.

2. Always adopt ethical principles and maintain proper etiquette in dealings with patients, relatives and other health personnel and to respect the rights of the patient including the right to information and second opinion.
3. Develop communication skills to word reports and professional opinion as well as to interact with patients, relatives, peers and paramedical staff, and for effective teaching.

C. Psychomotor domain

At the end of the course, the student should acquire following clinical & operative skills and be able to:

Operative Skills in Obstetrics and Gynaecology

- Adequate proficiency in common minor and major operations, post-operative management and management of their complications.
- Operative procedures which must be done by P G students during training period: ***(in graded manner - assisting, operating with senior person assisting, operating under supervision)***

(Operations MUST BE DONE/OBSERVED during PG training programme and log book maintained)

1. Obstetrics: Venesection, culdocentesis
Conduct normal deliveries
Episiotomy and its repair

- Application of forceps and ventouse (10).
- Carry out caesarian section delivery (10 must be done)
- Manual removal of placenta
- Management of genital tract obstetrical injuries.
- Post partum sterilization/Minilap tubal ligation (20 must be done)
- Medical termination of pregnancy - various methods (20 must be done)

2. Gynaecology: Endometrial / cervical biopsy.
Dilatation and curettage
Coldocentesis, Colpotomy

- Opening and closing of abdomen (10 must be done)
- Operations for pelvic organ prolapse
- Ovarian cyst operation
- Operation for ectopic pregnancy
- Vaginal and abdominal hysterectomy

Operations must be OBSERVED and/or ASSISTED when possible:

- Internal podalic version
- Caesarea Hysterectomy
- Internal iliac artery ligation
- Destructive obstetrical operations
- Tubal microsurgery
- Radical operations for gynaec malignancies
- Repair of genital fistulae
- Operations for incontinence
- Myomectomy, Laparoscopic and hysteroscopic surgery

Diagnostic Procedures

- Interpretation of x-rays - Twins, common fetal malformations / mal-presentations, abnormal pelvis (pelvimetry), Hysterosalpingography
- Sonographic pictures at various stages of pregnancy - normal and abnormal pregnancies, Fetal biophysical profile, common gynaecological pathologies.
- Amniocentesis
- Fetal surveillance methods - Electronic fetal monitoring and its interpretation
- Post-coital test
- Vaginal Pap Smear
- Colposcopy
- Endoscopy - Laparo and Hystero-scopy.

Health of Adolescent Girls and Post-Menopausal Women

- Provide advice on importance of good health of adolescent and postmenopausal women.
- Identification and management of health problems of post-menopausal women.
- Planning and intervention program of social, educational and health needs of adolescent girls and menopausal women.
- Provide education regarding rights and confidentiality of women's health, specifically related to reproductive function, sexuality, contraception and safe abortion.
- Provide advice on geriatric problems.

Reproductive Tract and 'HIV' Infection

- Provide advice on management of RTI and HIV infections in Indian women of reproductive age group.

- Provide advice on management of HIV infections in pregnancy, relationship of RTI and HIV with gynaecological disorders.
- Planning and implementation of preventive strategies.

Medico-legal Aspects

- Correct application of various Acts and Laws while practicing obstetrics and gynaecology, particularly MTP Act and sterilization, Preconception and P.N.D.T. Act.
- Implement proper recording of facts about history, examination findings, investigation reports and treatment administered in all patients.
- Implement the steps recommended for examination and management of rape cases.
- Follow proper procedures in the event of death of a patient.

Environment and Health

- Follow proper procedures in safe disposal of human body fluids and other materials.
- Follow proper procedures and universal precautions in examination and surgical procedures for the prevention of HIV and other diseases.

Syllabus

Course Contents:

Paper I

1. Basic Sciences

- Normal and abnormal development, structure and function (female and male) urogenital system and female breast.
- Applied Anatomy of genito-urinary system, abdomen, pelvis, pelvic floor, anterior abdominal wall, upper thigh (inguinal ligament, inguinal canal, vulva, rectum and anal canal).
- Physiology of spermatogenesis.
- Endocrinology related to male and female reproduction (Neurotransmitters).
- Anatomy and physiology of urinary and lower GI (Rectum / anal canal) tract.
- Development, structure and function of placenta, umbilical cord and amniotic fluid.
- Anatomical and physiological changes in female genital tract during pregnancy.
- Anatomy of fetus, fetal growth and development, fetal physiology and fetal circulation.
- Physiological and neuro-endocrinal changes during puberty, adolescence, menstruation, ovulation, fertilization, climacteric and menopause.

- Biochemical and endocrine changes during pregnancy, including systemic changes in cardiovascular, hematological, renal hepatic, renal, hepatic and other systems.
- Biophysical and biochemical changes in uterus and cervix during pregnancy and labor.
- Pharmacology of identified drugs used during pregnancy, labour, post-partum period in reference to their absorption, distribution, excretion, (hepatic) metabolism, transfer of the drugs across the placenta, effect of the drugs (used) on labor, on fetus, their excretion through breast milk.
- Mechanism of action, excretion, metabolism of identified drugs used in the management of Gynaecological disorder.
- Role of hormones in Obstetrics and Gynaecology.
- ***Markers in Obstetrics & Gynaecology*** - Non-neoplastic and neoplastic diseases
- Pathophysiology of ovaries, fallopian tubes, uterus, cervix, vagina and external genitalia in healthy and diseased conditions.
- Normal and abnormal pathology of placenta, umbilical cord, amniotic fluid and fetus.
- Normal and abnormal microbiology of genital tract. Bacterial, viral and parasitical infections responsible for maternal, fetal and gynaecological disorders.
- Humoral and cellular immunology in Obstetrics & Gynaecology.
- Gametogenesis, fertilization, implantation and early development of embryo.
- Normal Pregnancy, physiological changes during pregnancy, labor and pauperism.
- Immunology of pregnancy.
- Lactation.

2. Medical Genetics

- Basic medical genetics including cytogenetics.
- Pattern of inheritance
- Chromosomal abnormalities - types, incidence, diagnosis, management and recurrence risk.
- General principles of Teratology.
- Screening, counseling and prevention of developmental abnormalities.
- Birth defects - genetics, teratology and counseling.

Paper II

Clinical obstetrics

1. Antenatal Care:

- Prenatal care of normal pregnancy including examination, nutrition, immunization and follow up.
- Identification and management of complications and complicated of pregnancy – abortion, ectopic pregnancy, vesicular mole, Gestational trophoblastic Diseases, hyperemesis gravidarum, multiple pregnancy, antipartum hemorrhage, pregnancy induced hypertension, preeclampsia, eclampsia, Other associated hypertensive disorders, Anemia, Rh incompatibility, diabetes, heart disease, renal and hepatic diseases, preterm - post term pregnancies, intrauterine fetal growth retardation,
- Neurological, hematological, dermatological diseases, immunological disorders and other medical and surgical disorders/problems associated with pregnancy, Multiple pregnancies, Hydramnios, Oligoamnios.
- Diagnosis of contracted pelvis (CPD) and its management.
- High-risk pregnancy
- Pregnancy associated with complications, medical and surgical problems.
- Prolonged gestation.
- Preterm labor, premature rupture of membranes.
- Blood group incompatibilities.
- Recurrent pregnancy wastage.
- Evaluation of fetal and maternal health in complicated pregnancy by making use of diagnostic modalities including modern once (USG, Doppler, Electronic monitors) and plan for safe delivery for mother and fetus. Identifying fetus at risk and its management. Prenatal diagnostic modalities including modern ones.
- Infections in pregnancy (bacterial, viral, fungal, protozoan)
- Malaria, Toxoplasmosis.
- Viral – Rubella, CMV, Herpes, HIV, Hepatic viral infections (B, C etc)
- Sexually Transmitted Infections (STDs)
- Mother to fetal transmission of infections.
- Identification and management of fetal malpositions and malpresentations.
- Management of pregnancies complicated by medical, surgical (with other specialties as required) and gynecological diseases.
- Anemia, hematological disorders
- Respiratory, Heart, Renal, Liver, skin diseases.
- Gastrointestinal, Hypertensive, Autoimmune, Endocrine disorders.
- Associated Surgical Problems.
  Acute Abdomen (surgical emergencies - appendicitis and GI emergencies).
  Other associated surgical problems.
- Gynaecological disorders associate with pregnancy - congenital genital tract developmental anomalies, Gynaec pathologies - fibroid uterus, Ca Cx, genital prolapse etc.
- Prenatal diagnosis (of fetal problems and abnormalities), treatment – Fetal therapy
- M.T.P, PC & P.N.D.T Act etc

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- National health MCH programs, social obstetrics and vital statistics
- Recent advances in Obstetrics.

2. Intra-partum care:

- Normal labor - mechanism and management.
- Partographic monitoring of labor progress, recognition of abnormal labor and its appropriate management.
- Identification and conduct of abnormal labor and complicated delivery - breech, forceps delivery, caesarian section, destructive operations.
- Induction and augmentation of labor.
- Management of abnormal labor - Abnormal pelvis, soft tissue abnormalities of birth canal, mal-presentation, mal-positions of fetus, abnormal uterine action, obstructed labor and other distocias.
- Analgesia and anaesthesia in labor.
- Maternal and fetal monitoring in normal and abnormal labor (including electronic fetal monitoring).
- Identification and management of intrapartum complications, Cord presentation, complication of 3rd stage of labor - retained placenta, inversion of uterus, rupture of uterus, post partum hemorrhage.

3. Post Partum

- Complication of 3rd stage of labor retained placenta, inversion of uterus, post partum hemorrhage, rupture of uterus, Management of primary and secondary post-partum hemorrhage, retained placenta, uterine inversion. Post-partum collapse, amniotic fluid embolism
- Identification and management of genital tract trauma - perineal tear, cervical/vaginal tear, episiotomy complications, rupture uterus.
- Management of critically ill woman.
- Post partum shock, sepsis and psychosis.
- Postpartum contraception.
  Breast feeding practice; counseling and importance of breast-feeding. Problems in breast-feeding and their management, Baby friendly practices.
- Problems of newborn - at birth (resuscitation), management of early neonatal problems.
- Normal and abnormal purpureum - sepsis, thrombophlebitis, mastitis, psychosis.
  Hematological problems in Obstetrics including coagulation disorders. Use of blood and blood components/products.

4. Operative Obstetrics:

- Decision-making, technique and management of complications.
- Vaginal instrumental delivery, Caesarian section, Obst. Hysterectomy, destructive operations, manipulations (External/internal podalic version, manual removal of placenta etc)
- Medical Termination of Pregnancy - safe abortion - selection of cases, technique and management of complication. MTP law.

5. New Born

1. Care of new born: Normal and high risk new born (including NICU care).
2. Asphyxia and neonatal resuscitation.
3. Neonatal sepsis - prevention, detection and management.
4. Neonatal hyper - bilirubinemia - investigation and management.
5. Birth trauma - Detection and management.
6. Detection and management of fetal/neonatal malformation.
7. Management of common neonatal problems.

Paper III

Clinical Gynaecology and Fertility Regulation

- Epidemiology and etiopathogenesis of gynaecological disorders.
- Diagnostic modalities and management of common benign and malignant gynaecological diseases (diseases of genital tract):
  Fibroid uterus
  Endometriosis and adenomyosis
  Endometrial hyperplasia
  Genital prolapse (uterine and vaginal)
  Cervical erosion, cervicitis, cervical polyps, cervical neoplasia.
  Vaginal cysts, vaginal infections, vaginal neoplasia (VIN)
  Benign Ovarian pathologies
  Malignant genital neoplasia - of ovary, Fallopian tubes, uterus, cervix, vagina, vulva and Gestational Trophoblastic diseases, Cancer Breast.
- Diagnosis and surgical management of clinical conditions related to congenital malformations of genital tract. Reconstructive surgery in gynaecology.
- Intersex, ambiguous sex and chromosomal abnormalities.
- Reproductive endocrinology: Evaluation of Primary/secondary Amenorrhea, management of Hyperprolactinemia, Hirsutism, Chronic an-ovulation, PCOD, thyroid and other endocrine dysfunctions.
- Infertility - Evaluation and management
    - Methods of Ovulation Induction

- Tubal (Micro) surgery
- Management of immunological factors of Infertility
- Male infertility
- Obesity and other Infertility problems.
- **(Introductory knowledge of)** Advanced Assisted Reproductive Techniques (ART)

- Reproductive tract Infections: prevention, diagnosis and treatment.
  - STD
  - HIV
  - Other Infections
  - Genital Tuberculosis.
- Principles of radiotherapy and chemotherapy in gynaecological malignancies. Choice, schedule of administration and complications of such therapies.
- Rational approach in diagnosis and management of endocrinal abnormalities such as: menstrual abnormalities, amenorrhea (primary/secondary), dysfunctional uterine bleeding, polycystic ovarian disease, hyperprolactinemia (galoctorrhea), hyperandrogenism, thyroid - pituitary - adrenal disorders, menopause and its treatment (HRT).
- Urological problems in Gynaecology - Diagnosis and management.
  - Urinary tract infection
  - Urogenital Fistulae
  - Incontinence
  - Other urological problems
- Orthopedic problems in Gynaecology.
- Menopause: management (HRT) and prevention of its complications.
- Endoscopy (Laparoscopy - Hysteroscopy)
  - Diagnostic and simple therapeutic procedures (PG students must be trained to do these procedures)
  - Recent advances in gynaecology - Diagnostic and therapeutic
  - Pediatric, Adolescent and Geriatric Gyanecology
  - **Introduction to Advance Operative procedures.**

Operative Gynaecology

- Abdominal and Vaginal Hysterectomy
- Surgical Procedures for genital prolapse, fibromyoma, endometriosis, ovarian, adenexal, uterine, cervical, vaginal and vulval pathologies.
- Surgical treatment for urinary and other fistulae, Urinary incontinence
- Operative Endoscopy

Family Welfare and Demography

- Definition of demography and its importance in Obstetrics and Gynaecology.

- Statistics regarding maternal mortality, perinatal mortality/morbidity, birth rate, fertility rate.
- Organizational and operational aspects of National health policies and programs, in relation to population and family welfare including RCH.
- Various temporary and permanent methods of male and female contraceptive methods.
- Knowledge of in contraceptive techniques (including recent developments).
    1. Temporary methods
    2. Permanent Methods.
    3. Recent advances in contraceptive technology
- Provide adequate services to service seekers of contraception including follow up.
- Medical Termination of Pregnancy: Act, its implementation, providing safe and adequate services.
- Demography and population dynamics.
- Contraception (fertility control)

Male and Female Infertility

- History taking, examination and investigation.
- Causes and management of male infertility.
- Indications, procedures of Assisted Reproductive Techniques in relation to male infertility problems.

TEACHING AND LEARNING METHODS

Postgraduate Training

Teaching methodology should be imparted to the students through:

- Lectures, seminars, symposia, Inter- and intra- departmental meetings (clinic-pathological, Radio-diagnosis, Radiotherapy, Anaesthesia, Pediatrics/ Neonatology), maternal morbidity/mortality meetings and journal club. ***Records of these are to be maintained by the department.***
- By encouraging and allowing the students to attend and actively participate in CMEs, Conferences by presenting papers.
- Maintenance of log book: Log books shall be checked and assessed periodically by the faculty members imparting the training.
- Writing thesis following appropriate research methodology, ethical clearance and good clinical practice guidelines.
- The postgraduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.

- A postgraduate student of a postgraduate degree course in broad specialities/super specialities would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.
- Department should encourage e-learning activities.

Practical and Clinical Training

- Emphasis should be self learning, group discussions and case presentations.
- Student should be trained about proper History taking, Clinical examination, advising / ordering relevant investigations, their interpretation and instituting medical / surgical management by posting students in OPD, specialty clinics, wards, operation theaters, Labor room, family planning clinics and other departments like anesthesiology, neonatology, radiology/ radiotherapy. **Students should be able to perform and interpret ultra - sonography in Obstetrics and Gynaecology, NST, Partogram**

Rotations:

- Details of 3 years posting in the PG programme (6 terms of 6 months each)

a. Allied posts should be done during the course *– for 8 weeks*

i.	Neonatology	- 2 weeks
ii.	Anaesthesia	- 2 weeks
iii.	Radiology/Radiotherapy	- 2 weeks
iv.	Surgery	- 2 weeks
v.	Oncology	- 2 weeks

b. Details of training in the subject during resident posting

The student should attend to the duties (Routine and emergency):

Out patient Department and special clinics

Inpatients

Operation Theater

Labor Room

Writing clinical notes regularly and maintains records.

1st term - working under supervision of senior residents and teaching faculty.

2nd & 3rd term-	***Besides patient care in O.P.D., wards, Casualty and labor room, carrying out minor operations under supervision and assisting in major operation.***
4th 5th & 6th term -	***independent duties in management of patient including major operations under supervision of teaching faculty***

c. Surgeries to be done during PG training. **(Details in the Syllabus)**

During the training programme, patient safety is of paramount importance; therefore, skills are to be learnt initially on the models, later to be performed under supervision followed by performing independently; for this purpose, provision of surgical skills laboratories in medical colleges is mandatory.

ASSESSMENT

FORMATIVE ASSESSMENT, during the training includes

Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self directed learning and ability to practice in the system.

General Principles

Internal Assessment should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills. The Internal Assessment should be conducted in theory and clinical examination.

Quarterly assessment during the MS training should be based on following educational activities:

1. **Journal based / recent advances learning**
2. **Patient based /Laboratory or Skill based learning**
3. **Self directed learning and teaching**
4. **Departmental and interdepartmental learning activity**
5. **External and Outreach Activities / CMEs**

The student to be assessed periodically as per categories listed in postgraduate student appraisal form (Annexure I).

SUMMATIVE ASSESSMENT, ie., assessment at the end of training

The summative examination would be carried out as per the Rules given in POSTGRADUATE MEDICAL EDUCATION REGULATIONS, 2000.

Postgraduate Examination shall be in three parts:

1. Thesis

Every post graduate student shall carry out work on an assigned research project under the guidance of a recognised Post Graduate Teacher, the result of which shall be written up and submitted in the form of a Thesis. Work for writing the Thesis is aimed at contributing to the development of a spirit of enquiry, besides exposing the post graduate student to the techniques of research, critical analysis, acquaintance with the latest advances in medical science and the manner of identifying and consulting available literature.

Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination. The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination. A post graduate student shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners.

2. Theory Examination:

The examinations shall be organised on the basis of 'Grading'or 'Marking system' to evaluate and to certify post graduate student's level of knowledge, skill and competence at the end of the training. Obtaining a minimum of 50% marks in 'Theory' as well as 'Practical' separately shall be mandatory for passing examination as a whole. The examination for M.D./ MS shall be held at the end of 3rd academic year. An academic term shall mean six month's training period**.**

There should be four theory papers, as given below:

Paper I: Applied Basic sciences.
Paper II: Obstetrics including social obstetrics and Diseases of New Born
Paper III: Gynaecology including fertility regulation
Paper IV: Recent Advances in Obstetrics & Gynaecology

3. Clinical/Practical & oral/viva voce Examination: shall be as given below:

a) Obstetrics:

Clinical

Long Case: 1 case
2 cases with different problems

Short Case/ Spot Case: 1 case

Viva voce including:

- Instruments
- Pathology specimens
- Drugs and X-rays, Sonography etc.
- Dummy Pelvis

b) Gynaecology:

Clinical

Long Case: 1 case

2 cases with different problems

Short Case/ Spot Case: 1 case

Viva including:

- Instruments
- Pathology specimens
- Drugs and X-rays, Sonography etc.
- Family planning

Recommended Reading:

Books (latest edition)

Obstetrics

1. William Textbook of Obstetrics
2. High risk Obstetrics - James
3. High risk pregnancy - Ian Donal
4. Text book of Operative Obstetrics - Munro Kerr.
5. Medical disorder in pregnancy - De Sweit
6. High risk pregnancy - Arias
7. A text book of Obstetrics - Thrnbull
8. Text book of Obstetrics - Holland & Brews.
9. Manual of Obstetrics - Daftary & Chakravarty

Gynaecology

1. Text book of Gynaecology - Novak
2. Text book of Operative Gynaecology - Te-lindes
3. Text book of operative gynaecology - Shaws
4. Text book of Gynaecology and Reproductive Endocrinology - Speroft
5. Text book of Obstetrics & Gynaecology - Dewhurst
6. Manual of Gynaecological Oncology - Disai
7. Text book of Gynaecology – Jaeffcot

Journals

03-05 international Journals and 02 national (all indexed) journals

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Annexure I

Postgraduate Students Appraisal Form
Pre / Para /Clinical Disciplines

Name of the Department/Unit :

Name of the PG Student :

Period of Training : FROM.....TO.....

Sr. No.	PARTICULARS	Not Satisfactory	Satisfactory	More Than Satisfactory	Remarks
		1 2 3	4 5 6	7 8 9	
1.	Journal based / recent advances learning				
2.	Patient based /Laboratory or Skill based learning				
3.	Self directed learning and teaching				
4.	Departmental and interdepartmental learning activity				
5.	External and Outreach Activities / CMEs				
6.	Thesis / Research work				
7.	Log Book Maintenance				

Publications **Yes/ No**

Remarks*_____
_____
_____
_____

***REMARKS: Any significant positive or negative attributes of a postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.**

SIGNATURE OF ASSESSEE **SIGNATURE OF CONSULTANT** **SIGNATURE OF HOD**

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GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR MS IN OPHTHALMOLOGY

Preamble:

The purpose of PG education is to create specialists who would provide high quality health care and advance the cause of science through research & training.

The purpose of this programme is to standardize Ophthalmology teaching at post graduate level throughout the country so that it will benefit in achieving uniformity in post graduate and undergraduate teaching as well as result in creating competent ophthalmic surgeons with appropriate expertise.

The purpose of this document is to provide teachers and learners illustrative guidelines to achieve defined outcomes through learning and assessment. This document was prepared by various subject-content specialists. The Reconciliation Board of the Academic Committee has attempted to render uniformity without compromise to purpose and content of the document. Compromise in purity of syntax has been made in order to preserve the purpose and content. This has necessitated retention of “domains of learning” under the heading “competencies”.

SUBJECT SPECIFIC LEARNING OBJECTIVES

Programme Objectives

The clinical post graduate training programmes are intended at developing in a student a blend of qualities that of a clinical specialist, a teacher and a researcher. These programmes are organized such that a post graduate student should possess the following qualities, knowledge and skills:

a. The student should possess basic knowledge of the structure, function and development of the human body as related to ophthalmology, of the factors which may disturb these mechanisms and the disorders of structure and function which may result thereafter.
b. The student should be able to practice and handle most day-to-day problems independently in ophthalmology. The student should recognize the limitations of his/her own clinical knowledge and know when to seek further help.
c. The student should understand the effects of environment on health and be familiar with the epidemiology of at least the more common diseases in the field of ophthalmology.

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d. The student should be able to integrate the preventive methods with the curative and rehabilitative measures in the comprehensive management of the disease.

e. The student should be familiar with common eye problems occurring in rural areas and be able to deal with them effectively.

f. The student should also be made aware of Mobile Ophthalmic Unit and its working and components.

g. The student should be familiar with the current developments in Ophthalmic Sciences.

h. The student should be able to plan educational programmes in Ophthalmology in association with senior colleagues and be familiar with the modern methods of teaching and evaluation.

i. The student should be able to identify a problem for research, plan a rational approach to its solution, execute it and critically evaluate his/her data in the light of existing knowledge.

j. The student should reach the conclusions by logical deduction and should be able to assess evidence both as to its reliability and its relevance.

k. The student should have basic knowledge of medico-legal aspects of medicine.

l. The student should be familiar with patient counseling and proper consent taking.

SUBJECT SPECIFIC COMPETENCIES

A post graduate student upon successfully qualifying in the M.S. (Ophthalmology) examination should be able to:

a) Offer to the community, the current quality of 'standard of care' in ophthalmic diagnosis as well as therapeutics, medical or surgical, in most of the common situations encountered at the level of health services.

b) Periodically self assess his or her performance and keep abreast with ongoing advances in the field and apply the same in his/her practice.

c) Be aware of her/his own limitations to the application of the specialty in situations, which warrant referral to more qualified centers or individuals.

d) Apply research and epidemiological methods during his/her practice. The post graduate student should be able to present or publish work done by him/her.

e) Contribute as an individual/group towards the fulfillment of national objectives with regard to prevention of blindness.

f) Effectively communicate with patients or relatives so as to educate them sufficiently and give them the full benefit of informed consent to treatment and ensure compliance.

At the end of the course, the student should have acquired knowledge in the following:

A. Cognitive domain

Basic Medical Sciences:

- Attain understanding of the structure and function of the eye and its parts in health and disease.
- Attain understanding and application of knowledge of the structure and function of the parts of Central Nervous System and other parts of the body with influence or control on the structure and function of the eye.
- Attain understanding of and develop competence in executing common general laboratory procedures employed in diagnosis and research in Ophthalmology.

1. Clinical Ophthalmology:

Given adequate opportunity to work on the basis of graded responsibilities in outpatients, inpatient and operation theatres on a rational basis in the clinical sections from the day of entry to the completion of the training programme, the students should be able to:

- Acquire scientific and rational approach to the diagnosis of ophthalmic cases presented.
- Acquire understanding of and develop inquisitiveness to investigate to establish cause and effect of the disease.
- To manage and treat all types of ophthalmic cases.
- To competently handle and execute safely all routine surgical procedures on lens, glaucoma, lid, sac, adnexa, retina and muscle anomalies.
- To competently handle all ophthalmic medical and surgical emergencies.
- To be familiar with micro-surgery and special surgical techniques.
- To demonstrate the knowledge of the pharmacological (including toxic) aspects of drugs used in ophthalmic practice and drugs commonly used in general diseases affecting the eyes.

2. Refraction:

- Acquire competence in assessment of refractive errors and prescription of glasses for all types of refraction problems.
- Acquire basic knowledge of manufacture and fitting of glasses and competence of judging the accuracy and defects of the dispensed glasses.

3. Ophthalmic super-specialties:

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Given an opportunity to work on a rotational basis in various special clinics of sub-specialties of ophthalmology, if possible, the student should be able to:

- Examine, diagnose and demonstrate understanding of management of the problems of neuro-ophthalmology and refer appropriate cases to neurology and neuro-surgery.
- Examine, diagnose and demonstrate understanding of management of (medical and surgical) complicated problems in the field of (a) lens, (b) glaucoma, c) cornea, (d) retina, (e) pediatric ophthalmology, (f) oculoplasty, (g) uvea, and (I) genetic problems in ophthalmology.
- To demonstrate understanding of the manufacture, and competence in prescription and dispensing of contact lenses and ocular prosthesis.

5. Ophthalmic pathological/microbiological/biochemical sciences

- Be able to interpret the diagnosis in correlation with the clinical data and routine materials received in such cases.

6. Community Ophthalmology

Eye camps may be conducted where the PG students are posted for imparting training to according to a set methodology. The community and school surveys may also be conducted by the post graduate students.

The post graduate students are given an opportunity to participate in surveys, eye camps. They should be able to guide rehabilitation workers in the organisation and training of the blinds in art of daily living and in the vocational training of the blind leading to gainful employment.

7. Research :

- Recognise a research problem.
- State the objectives in terms of what is expected to be achieved in the end.
- Plan a rational approach with appropriate controls with full awareness of the statistical validity of the size of the material.
- Spell out the methodology and carry out most of the technical procedures required for the study.
- Accurately and objectively record on systematic lines results and observation made.
- Analyze the data with the aid of an appropriate statistical analysis.

- Interpret the observations in the light of existing knowledge and highlight in what ways the study has advanced existing knowledge on the subject and what further remains to be done.
- Write a thesis in accordance with the prescribed instructions.
- Write at least one scientific paper as expected of International Standards from the material of this thesis.

B. Affective Domain:

1. Should be able to function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the patient and the clinician or other colleagues to provide the best possible diagnosis or opinion.

2. Always adopt ethical principles and maintain proper etiquette in dealings with patients, relatives and other health personnel and to respect the rights of the patient including the right to information and second opinion.

3. Develop communication skills to word reports and professional opinion as well as to interact with patients, relatives, peers and paramedical staff, and for effective teaching.

C. Psychomotor domain

At the end of the course, the student should acquire following clinical skills:

Essential diagnostic skills:

I. Examination techniques along with interpretation

1. Slit lamp Examination

i. Diffuse examination
ii. Focal examination
iii. Retroillumination – direct and indirect
iv. Sclerotic scatter
v. Specular reflection
vi. Staining modalities and interpretation

2. Fundus evaluation

- Direct/Indirect ophthamoscopy
- Fundus drawing
- 3-mirror examination of the fundus
- 78-D/90-D/60-D examination
- Amsler’s charting

II. Basic investigations along with their interpretation

1. Tonometry

Tonometry - Applanation/Identation/Non-contact

2. Gonioscopy

Gonioscopy grading of the anterior chamber angle

3. Tear/ Lacrimal function tests

i. Staining- fluorescein and Rose Bengal
ii. Schirmer test/tear film break up time
iii. Syringing
iv. Dacrocystography

4. Corneal

- Corneal scraping and cauterization
- Smear preparation and interpretation (Gram's stain /KOH)
- Media inoculation
- Keratometry - performance and interpretation
- Pachymetry
- Corneal topography - if available

5. Colour Vision evaluation

- Ishihara pseudoisochromatic plates
- Farnsworth Munsell, if available

6. Refraction

i. Retinoscopy- Streak/ Priestley Smith
ii. Use of Jackson's cross-cylinder
iii. Subjective and objective refraction
iv. Prescription of glasses

7. Diagnosis and assessment of Squint

i. Ocular position and motility examination
ii. Synoptophore usage
iii. Lees screen usage
iv. Diplopia charting
v. Assessment of strabismus - cover tests/prisms bars
vi. Amblyopia diagnosis and treatment
vii. Assessment of convergence, accommodation, stereopsis, suppression

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8. Exophthalmometry

Usage of Hertel's exophthalmometer - proptosis measurement

9. Contact lenses

- Fitting and assessment of RGP and soft lenses
- Subjective verification of over refraction
- Complications arising of contact lens use
- Educating the patient regarding CL usage and imparting relevant knowledge of the complications arising thereon

10. Low Vision Aids

- Knowledge of basic optical devices available and relative advantages and disadvantages of each.
- The basics of fitting with knowledge of availability & cost

III. The post graduate must be well versed with the following investigative modalities although the student may or may not perform it individually. But, she/he should be able to interpret results of the following tests:

1. Fundus photography
2. Fluorescein angiography
3. Ophthalmic ultrasound A-scan/B scan
4. Automated perimetry for glaucoma and neurological lesions
5. Radiological tests - X rays - Antero posterior/ Lateral view
   PNS (Water's view) / Optic canal views

   Localisation of intra-ocular and intra-orbital FBs

   Interpretations of -USG/ CT/ MRI Scans
6. OCT and UBM
7. ERG, EOG, and VEP

IV. Minor surgical procedures – Must know and perform independently

- Conjunctival and corneal foreign body removal on the slit lamp
- Chalazion incision and curettage
- Pterygium excision
- Biopsy of small lid tumours
- Suture removal- skin/conjunctival/corneal/ corneoscleral
- Tarsorrhaphy
- Subconjunctival injection
- Retrobulbar, parabulbar anaesthesia
- Posterior Sub-Tenon's injections

- Artificial eye fitting

V. Surgical procedures

1. Must know and can perform independently

a. Ocular anaesthesia:

- Retrobulbar anaesthesia
- Peribulbar anaesthesia
- Facial blocks- O'Brein / Atkinson/Van lint and modifications
- Frontal blocks
- Infra orbital blocks
- Blocks for sac surgery

2. Must be able to independently perform and deal with complications arising from the following surgeries :

- Lid Surgery - Tarsorrhaphy
  Ectropion and entropion
  Lid repair following trauma
  Epilation
- Destructive procedures
  Evisceration with or without implant
  Enucleation with or without implant

- Sac surgery
  i. Dacryocystectomy
  ii. Dacryocystorhinostomy
  iii. Probing for congenital obstruction of nasolacrimal duct

- Strabismus surgery
  Recession and resection procedures on the horizontal recti.
- Orbit surgery
  Incision and drainage via anterior orbitotomy for abscess
- Cyclocryotherapy/Cyclophotocoagulation

3. PG Students should be well conversant with use of operating microscope and must be able to perform the surgeries listed below competently under the same:

- Cataract surgery
  i. Standard ECCE (extracapsular cataract extraction; first year) with or without IOL implantation

ii. Small incision ECCE with or without IOL implantation and/or Phacoemulsification with PC IOL implantation

iii. Intracapsular cataract extraction (second year)

iv. Cataract with Phacoemusification (third year)

v. Secondary AC or PC IOL implantation

- Vitrectomy/Scleral buckling
    - Intra-vitreal and intra-cameral (anterior chamber) injection techniques and doses of drugs for the same
    - Needs to know the basis of open sky vitrectomy (anterior segment) as well as management of cataract surgery complications.
    - Assisting vitrectomy and scleral buckling procedures
- Ocular surface procedures

  Pterygium excision with modifications

  Conjunctival cyst excision/foreign body removal

  Corneal foreign body removal

  Conjunctival flap/ peritomy
- Glaucoma

  Trabeculectomy
- Corneal

  Repair of corneo - scleral perforations

  Corneal suture removal

  Application of glue and bandage contact lens

4. Should have performed/assisted the following microscopic surgeries

   i. Keratoplasty

   Therapeutic and optical

   ii Glaucoma surgery

   Pharmacological modulation of trabeculectomy

   Trabeculotomy

   Goniotomy

   Glaucoma valve implant surgery

5. Desirable to be able to perform following laser procedures
    - Yag Capsulotomy
    - Laser iridotomy
    - Focal and panretinal photocoagulation
6. Should have assisted/knowledge of Keratorefractive procedures

Operations:

The PG is provided with an opportunity to perform operations both extra-ocular and intra-ocular with the assistance of the senior post graduate students and/or under the direct supervision of a faculty member. The student is provided with an opportunity

to learn special and complex operations by assisting the senior post graduate student or the faculty in operations of cases of the specialty and be responsible for the post-operative care of these cases.

In **first phase**, the post graduate student is given training in preparations of cases for operation, pre-medication and regional anaesthetic blocks. In the **next phase**, the post graduate student assists the operating surgeon during the operations. In the **third phase**, the post graduate student operates independently assisted by senior post graduate student or a faculty member. She/he is required to be proficient in some operations and show familiarity with others.

Syllabus

Course contents:

These are only broad guidelines and are illustrative, there may be overlap between sections.

I. Basic Sciences:

1. Orbital and ocular anatomy
    i. Gross anatomy
    ii. Histology
    iii. Embryology
2. Ocular Physiology
3. Ocular Pathology
4. Ocular Biochemistry
    General biochemistry, biochemistry applicable to ocular function
5. Ocular Microbiology
    General Microbiology, specific microbiology applicable to the eye
6. Immunology with particular reference to ocular immunology
7. Genetics in ophthalmology
8. Community Eye Health

II. Optics

a. Basic physics of optics
b. Applied ophthalmic optics
c. Applied optics including optical devices
d. Disorders of Refraction

III. Clinical Ophthalmology

i. Disorders of the lids
ii. Disorders of the lacrimal system
iii. Disorders of the Conjunctiva
iv. Disorders of the Sclera

v. Disorders of the Cornea
vi. Disorders of the Uveal Tract
vii. Disorders of the Lens
viii. Disorders of the Retina
ix. Disorders of the Optic Nerve and Visual Pathway
x. Disorders of the Orbit
xi. Glaucoma
xii. Neuro-ophthalmology
xiii. Paediatric ophthalmology
xiv. Ocular involvement in systemic disease
xv. Immune ocular disorders
xvi. Strabismus and Amblyopia
xvii. Ocular oncology

TEACHING AND LEARNING METHODS

Teaching Methodology:

The theoretical knowledge is imparted to the post graduate student through distinct courses of lecture demonstrations, seminars, symposia and inter- and intra-departmental meetings. The students are exposed to recent advances through discussions in journal clubs and participation in CMEs, and symposia.

The post graduate students are imparted clinical training in several ways:

1. ***Group Discussion***

   The junior post graduate students may present the symposium to their senior postgraduates where it is fully discussed before finally being discussed in front of the faculty or senior eye specialists. A free and fair discussion is encouraged. These discussions enable the post graduate students to prepare for a general discussion in the class.

2. ***Clinical Case discussion***

a. Bedside discussion on the rounds and outpatient teaching take their toll with patient management. Therefore in addition to these, clinical case discussions should form part of a department's schedule at a fixed time every week. This could range from 1-2 hours and could be held at least once a week. The choice and manner of presentation and discussion varies widely and is left to the discretion of the department. Every effort should be made to include as wide a variety of cases as possible over three years with multiple repetitions. Problem oriented approach is better as it aids in decision making skills.

b. In addition to bedside teaching rounds, at least 5-hr of formal teaching per week are necessary.

c. Consultant case presentation is another approach which should be encouraged as it aids in solving complex problems and also is forum for discussion of interesting cases.

d. Case discussions on the patient's records written by the student is to be encouraged as it helps exercise the student's diagnostic and decision making skills. It also helps the consultant in critical evaluation of the student's progress academically.

e. Case presentation at other in-hospital multidisciplinary forums.

f. The postgraduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.

g. Department should encourage e-learning activities.

3. Seminars

Seminars should be conducted at least once weekly. The duration should be at least one hour. The topics selected should be repeated once in 3 years so as to cover as wide a range of topics as possible. Seminars could be individual presentations or a continuum (large topic) with many post graduate students participating.

4. Journal clubs

Journals are reviewed in particular covering all articles in that subject over a 6 months period and are discussed by the post graduate student under the following headings.

1) Aim 2) Methods 3) Observations
4) Discussions and 5) Conclusions

The post graduate student to whom the journal is allotted presents the journal summaries to the senior postgraduates. They are expected to show their understanding of the aspects covered in the article and clarify any of the points raised in the article, offer criticisms and evaluate the article in the light of known literature.

5. A postgraduate student of a postgraduate degree course in broad specialities/super specialities would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.

6. Out-Patients: For the first six months of the training programme, post graduate students may be attached to a faculty member to be able to pick up methods of history taking and ocular examination in ophthalmic practice. During this period

the post graduate student may also be oriented to the common ophthalmic problems. After 6 months, the clinical post graduate student may work independently, where he receives new and old cases including refractions and prescribes for them. The post graduate students are attached to a senior post graduate student and faculty member whom they can consult in case of difficulty.

7. **Wards:** Each post graduate student may be allotted beds in the in-patient section depending upon the total bed capacity and the number of the post graduates. The whole concept is to provide the post graduate student increasing opportunity to work with increasing responsibility according to seniority. A detailed history and case record is to be maintained by the post graduate student.

Relevance of beds and admissions in Ophthalmology has really gone down at present, as most of the surgical and special investigative procedures are being performed on out-patient basis. Most of the teaching has to be imparted in out-patients department and special Clinics.

8. **Rotations: Specialty clinics**

The student may rotate in the following subspecialty clinics:

- Anterior segment and cataract
- Glaucoma
- Oculoplastics
- Paediatric ophthalmology and strabismus
- Retina and Uvea
- Cornea, Contact lens and low vision
- Neuroophthalmology
- Refractive Clinic

9. **Practicals in Ocular Histopathology**

The post graduate students may be provided with fully stained slides of the ocular tissues along with relevant clinical data and discuss the diagnosis and differential diagnosis on the basis of the information provided

10. Attend accredited scientific meetings (CME, Symposia, and Conferences).

11. Additional sessions on basic sciences, biostatistics, research methodology, teaching methodology, hospital waste management, health economics, medical ethics and legal issues related to ophthalmology practice are suggested.

13. Maintenance of **log book**: Log books shall be checked and assessed periodically by the faculty members imparting the training.

During the training programme, patient safety is of paramount importance; therefore, skills are to be learnt initially on the models, later to be performed under supervision followed by performing independently; for this purpose, provision of surgical skills laboratories in medical colleges is mandatory.

ASSESSMENT

FORMATIVE ASSESSMENT, ie, during the training

Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self directed learning and ability to practice in the system.

FORMATIVE ASSESSMENT, ie., during the training

General Principles

Internal Assessment should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills. The Internal Assessment should be conducted in theory and clinical examination.

Quarterly assessment during the MS training should be based on following educational activities:

1. **Journal based / recent advances learning**
2. **Patient based /Laboratory or Skill based learning**
3. **Self directed learning and teaching**
4. **Departmental and interdepartmental learning activity**
5. **External and Outreach Activities / CMEs**

The student to be assessed periodically as per categories listed in postgraduate student appraisal form (Annexure I)

SUMMATIVE ASSESSMENT, ie., assessment at the end of training

The summative examination would be carried out as per the Rules given in **POSTGRADUATE MEDICAL EDUCATION REGULATIONS, 2000.**

The Post Graduate examination shall be in three parts:

1. Thesis:

Every post graduate student shall carry out work on an assigned research project under the guidance of a recognised Post Graduate Teacher, the result of which shall

be written up and submitted in the form of a Thesis. Work for writing the Thesis is aimed at contributing to the development of a spirit of enquiry, besides exposing the post graduate student to the techniques of research, critical analysis, acquaintance with the latest advances in medical science and the manner of identifying and consulting available literature.

Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination. The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination. A post graduate student shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners. From regulations)

2. Theory Examination:

The examinations shall be organised on the basis of 'Grading'or 'Marking system' to evaluate and to certify post graduate student's level of knowledge, skill and competence at the end of the training. Obtaining a minimum of 50% marks in 'Theory' as well as 'Practical' separately shall be mandatory for passing examination as a whole. The examination for M.D./ MS shall be held at the end of 3rd academic year. An academic term shall mean six month's training period.

There shall be four theory papers.

Paper I: Basic Sciences related to Ophthalmology, Refraction & Optics

Paper II: Clinical Ophthalmology

Paper III: Systemic Diseases in Relation to Ophthalmology

Paper IV: Recent Advances in Ophthalmology and Community Ophthalmology

3. Clinical/Practical and oral/viva voce examination

Clinical

1 long case

2 short cases with different problems

2 fundus Cases

1 refraction case

. **Oral/Viva voce Examination shall be comprehensive enough to test the** post graduate student**'s overall knowledge of the subject and shall include:**

i. Instruments
ii. Pathology specimens
iii. Drugs, X-rays, USG/OCT/CT/MRI Scans, etc.
iv. Visual fields and other ophthalmic diagnostic charts

Recommended Reading:

Books (latest edition)

1. Ophthalmic Surgery: Principles and Techniques. Blackwell Science. Albert DM.
2. Principles and Practice of Ophthalmology. Albert DM, Jakobiec. W B Saunders
3. Principles & Practice of Ophthalmology. Gholam A Paymen
4. The Current American Academy of Ophthalmology Basic and Clinical Science Course (13 volumes)
5. Duke Elder's Practice of Refraction. Abrams D. Churchill Livingstone.
6. Text book of Ophthalmology. Yanoff and Duker
7. Retina. Stephen J Ryan:
8. Ophthalmic Ultrasound: Sandra Byrne and Ronald Green.
9. Cornea: Fundamentals, Diagnosis, and Management. Krachmer JH, Mannis MJ, Holland EJ. Mosby Elsevier.
10. Ophthalmology. Yanoff N, Duker JS. Mosby Elsevier.
11. Review of Ophthalmology. Friedman NJ, Kaiser PK, Trattler WB. Elseview Saunders, Philadelphia.
12. Corneal Transplantation. Vajpayee RB. Jaypee Brothers Medical Publishers (P) Ltd, New Delhi.
13. Fundamentals of Clinical Ophthalmology Series. Coster D. Cornea. Blackwell Publishing Limited.
14. The Contact Lens Manual. A practical guide to fitting. Gasson A, Morris A J. Butterworth Heinemann Elsevier.
15. Steinert's cataract surgery.
16. Shields Text book of glaucoma
17. Smith and Nozik : Uvea
18. Rootman's diseases of the orbit
19. Eyelid, conjunctival and orbital tumors. An atlas and textbook. Shields JA, Shields CL. Philadelphia: Lippincott Williams & Wilkins.
20. Intraocular tumors. An atlas and textbook. Shields JA, Shields CL.
21. Pediatric Ophthalmology. Taylor and Hoyt: Saunders Ltd.
22. Management of Strabismus and Amblyopia. Pratt-Johnson and Tilson: Thieme Verlag.
23. Handbook of Pediatric Eye and Systemic disease. Wright, Spiegel and Thompson.
24. BinocularVision and Ocular Motility. Theory and Management of Strabismus. Von Noorden GK. Mosby.
25. Surgical Management of Strabismus. Helveston:
26. Strabismus: A Decision Making Approach. Von Noorden and Helveston:
27. Thyroid Eye Diseases. Char DR. Williams and Wilkins, Baltimore.

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28. A Manual of Systematic Eyelid Surgery.Collin JRO (ed). Churchill Livingstone, Edinburgh.
29. Refractive Surgery. Agarwal A, Agarwal A, Jacob Soosan. Jaypee.
30. LASIK Complications, Prevention and management. Gimbel HV, Penno EEA. Slack Inc.
31. Management of Complications of Refractive Surgery. Alio JL, Azar DT. Springer.
32. Quality of Vision: Essential Optics for the Cataract and Refractive Surgeon. Holladay JT. Slack Inc.
33. Ocular Pharmacology: Havener
34. Anatomy: Wolff 's Anatomy of the Eye and Orbit
35. Physiology: Adler's Physiology of the Eye
36. Textbook of Ophthalmology (2 volumes). Easty DL, Sparrow JM.Oxford Oxford Medical Publications.
37. The Eye. Basic Sciences in Practice. Forrester JV, Dick AD, McMenamin PG, Lee WR. W B Saunders.
38. A Stereoscopic Atlas of Macular Diseases: Diagnosis and Treatment. Gass JDM.
39. Neuroophthalmology. Glaser JS. LipincottWilliams & Wilkins. .
40. Clinical Ophthalmic Pathology. Harry J, Misson G. Butterworth/Heinemann.
41. Inherited Retinal Diseases. A Diagnostic Guide. Jimenez Sierra JM, Ogden TE, Van Boemel GB. Mosby.
42. Clinical Ophthalmology. Kanski JJ. Butterworth/Heinemann.
43. ABC of Resuscitation. Colquhoun, M. C., Evans, T. R., Handley, A. J. BMJ Publishing Group.
44. Walsh and Hoyt's Clinical Neuroophthalmology (5 volumes). Miller NR, Newman NJ, Williams and Wilkins.
45. The human eye. Oyster CW Sinauer Associates. Sunderland. Massachusetts
46. Paediatric Ophthalmology. Taylor D. Blackwell Science.
47. Decision Making in Ophthalmology. Van Heuven WAJ, Zwann J. Mosby.
48. Parsons' Diseases of the eye. Sihota and Tandon.
49. Wills Eye Manual
50. International Council of Ophthalmology Residency Curriculum available at http://www.icoph.org/

Journals

03-05 international Journals and 02 national (all indexed) journals

Annexure I

Postgraduate Students Appraisal Form
Pre / Para /Clinical Disciplines

Name of the Department/Unit :

Name of the PG Student :

Period of Training : FROM……TO……

Sr. No.	PARTICULARS	Not Satisfactory	Satisfactory	More Than Satisfactory	Remarks
		1 2 3	4 5 6	7 8 9	
1.	Journal based / recent advances learning				
2.	Patient based /Laboratory or Skill based learning				
3.	Self directed learning and teaching				
4.	Departmental and interdepartmental learning activity				
5.	External and Outreach Activities / CMEs				
6.	Thesis / Research work				
7.	Log Book Maintenance				

Publications **Yes/ No**

Remarks*_____
_____
_____
_____

***REMARKS: Any significant positive or negative attributes of a postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.**

SIGNATURE OF ASSESSEE **SIGNATURE OF CONSULTANT** **SIGNATURE OF HOD**

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GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR MS IN GENERAL SURGERY

Preamble:

The purpose of PG education is to create specialists who would provide high quality health care and advance the cause of science through research & training.

A post graduate specialist having undergone the required training should be able to recognize the health needs of the community, should be competent to handle effectively medical / surgical problems and should be aware of the recent advances pertaining to his specialty. The PG student should be competent to provide professional services with empathy and humane approach. The PG student should acquire the basic skills in teaching of medical / para-medical students and is also expected to know the principles of research methodology and self-directed learning for continuous professional development.

The purpose of this document is to provide teachers and learners illustrative guidelines to achieve defined outcomes through learning and assessment. This document was prepared by various subject-content specialists. The Reconciliation Board of the Academic Committee has attempted to render uniformity without compromise to purpose and content of the document. Compromise in purity of syntax has been made in order to preserve the purpose and content. This has necessitated retention of “domains of learning” under the heading “competencies”.

SUBJECT SPECIFIC LEARNING OBJECTIVES

Clinical Objectives

At the end of postgraduate training, the PG student should be able to: -

1. diagnose and appropriately manage common surgical ailments in a given situation.
2. provide adequate preoperative, post-operative and follow-up care of surgical patients.
3. identify situations calling for urgent or early surgical intervention and refer at the optimum time to the appropriate centers.
4. counsel and guide patients and relatives regarding need, implications and problems of surgery in the individual patient.
5. provide and coordinate emergency resuscitative measures in acute surgical situations including trauma.
6. organize and conduct relief measures in situations of mass disaster including triage.

7. effectively participate in the National Health Programs especially in the Family Welfare Programs.
8. discharge effectively medico-legal and ethical responsibilities and practice his specialty ethically.
9. must learn to minimize medical errors.
10. must update knowledge in recent advances and newer techniques in the management of the patients.
11. must learn to obtain informed consent prior to performance of operative procedure.
12. perform surgical audit on a regular basis and maintain records (manual and/or electronic) for life.
13. participate regularly in departmental academic activities by presenting Seminar, Case discussion, Journal Club and Topic discussion on weekly basis and maintain logbook.
14. demonstrate sufficient understanding of basic sciences related to his specialty.
14. plan and advise measures for the prevention and rehabilitation of patients belonging to his specialty.

Research:

The student should:

1. know the basic concepts of research methodology, plan a research project and know how to consult library.
2. should have basic knowledge of statistics.

Teaching:

The student should learn the basic methodology of teaching and develop competence in teaching medical/paramedical students.

Professionalism:

1. The student will show integrity, accountability, respect, compassion and dedicated patient care. The student will demonstrate a commitment to excellence and continuous professional development.
2. The student should demonstrate a commitment to ethical principles relating to providing patient care, confidentiality of patient information and informed consent.
3. The student should show sensitivity and responsiveness to patients' culture, age, gender and disabilities.

SUBJECT SPECIFIC COMPETENCIES

By the end of the course, the student should have acquired knowledge (cognitive domain), professionalism (affective domain) and skills (psychomotor domain) as given below:

A. Cognitive domain

- Demonstrate knowledge of applied aspects of basic sciences like applied anatomy, physiology, biochemistry, pathology, microbiology and pharmacology.
- Demonstrate knowledge of the bedside procedures and latest diagnostics and therapeutics available.
- Describe aetoiology, pathophysiology, principles of diagnosis and management of common surgical problems including emergencies, in adults and children.
- Demonstrate the theoretical knowledge of general principles of surgery.
- Demonstrate the theoretical knowledge of systemic surgery including disaster management and recent advances.
- Demonstrate the theoretical knowledge to choose, and interpret appropriate diagnostic and therapeutic imaging including ultrasound, Mammogram, CT scan, MRI.
- Demonstrate the knowledge of ethics, medico-legal aspects, communication skills and leadership skills. The PG student should be able to provide professional services with empathy and humane approach.

B. Affective domain

- Should be able to function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the patient and the clinician or other colleagues to provide the best possible diagnosis or opinion.
- Always adopt ethical principles and maintain proper etiquette in dealings with patients, relatives and other health personnel and to respect the rights of the patient including the right to information and second opinion.
- Develop communication skills to word reports, obtain a proper relevant history and professional opinion as well as to interact with patients, relatives, peers and paramedical staff, and for effective teaching.
- Obtain informed consent for any examination/procedure and explain to the patient and attendants the disease and its prognosis with a humane approach.
- Provide appropriate care that is ethical, compassionate, responsive and cost effective and in conformation with statutory rules.

C. Psychomotor domain

- Perform a humane and thorough clinical examination including internal examinations and examinations of all organs/systems in adults and children
- Write a complete case record with all necessary details.
- Arrive at a logical working diagnosis / differential diagnosis after clinical examination.
- Order appropriate investigations keeping in mind their relevance (need based).
- Choose, perform and interpret appropriate imaging in trauma - ultrasound FAST (Focused Abdominal Sonography in Trauma).

- Perform minor operative procedures and common general surgical operations independently and the major procedures under guidance.
- Provide basic and advanced life saving support services in emergency situations
- Provide required immediate treatment and comprehensive treatment taking the help of specialist as required.
- Perform minimally invasive surgery in appropriate clinical settings. Must have undergone basic training in operative laparoscopy related to general and GI Surgery.
- Undertake complete patient monitoring including the preoperative and post operative care of the patient.
- Write a proper discharge summary with all relevant information.

Syllabus

Course Contents:

No limit can be fixed and no fixed number of topics can be prescribed as course contents. She/he is expected to know the subject in depth, however, emphasis should be on the diseases/health problems most prevalent in that area. Knowledge of recent advances and basic sciences as applicable to his/her specialty should get high priority. Competence in surgical skills commensurate with the specialty (actual hands - on training) must be ensured.

1. General topics:

A student should have fair knowledge of basic sciences (Anatomy, Physiology, Biochemistry, Microbiology, Pathology and Pharmacology) as applied to his specialty. Further, the student should acquire in-depth knowledge of his subject including recent advances and should be fully conversant with the bedside procedures (diagnostic and therapeutic) and having knowledge of latest diagnostics and therapeutics available.

1. History of medicine with special reference to ancient Indian texts
2. Health economics - basic terms, health insurance
3. Medical sociology, doctor-patient relationship, family adjustments in disease, organizational behavior, conflict resolution
4. Computers - record keeping, computer aided learning, virtual reality, robotics
5. Hazards in hospital and protection:
   AIDS, hepatitis B, tuberculosis, radiation, psychological
6. Environment protection - bio-medical waste management
7. Surgical audit, evidence based surgical practice, quality assurance
8. Concept of essential drugs and rational use of drugs
9. Procurement of stores and material & personal management

10. Research methodology - library consultation, formulating research, selection of topic, writing thesis protocol, preparation of consent form from patients
11. Bio-medical statistics, clinical trials
12. Medical ethics
13. Consumer protection
14. Newer antibiotics
15. Problem of resistance.
16. Sepsis - SIRS
17. Nosocomial infection
18. Advances in imaging technologies
19. Disaster management, mass casualties, Triage
20. O.T. design, technologies, equipment
21. Critical care in surgical practice
22. Response to trauma
23. Wound healing
24. Fluid and electrolyte balance
25. Nutrition
26. Blood transfusion
27. Brain death
28. Cadaveric organ retrieval

1. Systemic Surgery

The student must acquire knowledge in the following important topics are but teaching should not be limited to these topics. A standard text-book may be followed, which will also identify the level of learning expected of the trainees.

- Wound healing including recent advances
- Asepsis, antisepsis, sterilization and universal precaution
- Surgical knots, sutures, drains, bandages and splints
- Surgical infections, causes of infections, prevention
- Common aerobic and anaerobic organisms and newer organisms causing infection including *Helicobacter Pylori*
- Tetanus, gas gangrene treatment & prevention
- Chronic specific infections TB, Filariasis
- Boils, cellulites, abscess, narcotizing fascitis and synergistic infection
- Antibiotic therapy rationale including antibiotic prophylaxis, misuse, abuse
- Hospital acquired nosocomial infection causes and prevention including MRSA etc.
- HIV, AIDS and Hepatitis B & C, Universal precautions when dealing with patients suffering from these diseases
- Fluid and electrolyte balance including acid – base disturbance, consequences,

interpretation of blood gas analysis data and management

- Rhabdomyolysis and prevention of renal failure
- Shock (septicaemic, hypovolaemic, Neurogenic, anaphylactic), etiology, pathophysiology and management
- Blood and blood components, transfusion indication, contraindication, mismatch and prevention and management of complications of massive blood transfusion
- Common preoperative preparation (detailed preoperative workup, risk assessment according to the disease and general condition of the patient as per ASA grade) and detailed postoperative complications following major and minor surgical procedures
- Surgical aspects of diabetes mellitus particularly management of diabetic foot and gangrene, preoperative control of diabetes, consequences of hypo- and hyper-glycaemia in a postoperative setting
- Consequences and management of bites and stings including snake, dog, human bites
- Mechanisms and management of missile, blast and gunshot injuries
- Organ transplantation: Basic principles including cadaver donation, related Human Organ Transplant Acts, ethical and medicolegal aspects.
- Nutritional support to surgical patients
- Common skin and subcutaneous condition
- Sinus and fistulae, pressure sores
- Acute arterial occlusion, diagnosis and initiate management
- Types of gangrene, Burger's disease and atherosclerosis
- Investigations in case of arterial obstruction, amputation, vascular injuries: basic principles and management
- Venous disorders: Varicose veins
- Diagnosis, principles of therapy, prevention of DVT: basic principles and management
- Lymphatic: Diagnosis and principles of management of lymphangitis and lymphedema
- Surgical management of Filariasis
- Burns: causes, prevention and management
- Wounds of scalp and its management
- Recognition, diagnosis and monitoring of patients with head injury, Glasgow coma scale
- Undergo advanced trauma and cardiac support course (certified) before appearing in final examination
- Recognition of acute cerebral compression, indication for referrals.
- Cleft lip and palate
- Leukoplakia, retention cysts, ulcers of tongue

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- Oral malignancies
- Salivary gland neoplasms
- Branchial cyst, cystic hygroma
- Cervical lymphadenitis nonspecific and tuberculous, metastatic lymph nodes and lymphomas.
- Diagnosis and principles of management of goitre
- Thyroglossal cyst and fistula
- Thyrotoxicosis
- Thyroid neoplasms
- Management of solitary thyroid nodule
- Thoracic outlet syndrome
- Management of nipple discharge
- Breast abscess
- Clinical breast examination, breast self examination
- Screening and investigation of breast lump
- Concept of Single Stop Breast Clinic
- Cancer breast diagnosis, staging and multimodality management (common neoadjuvant and adjuvant and palliative chemotherapy protocols and indications of radiation and hormonal therapy, pathology and interpretation of Tumour Markers, breast cancer support groups and counseling)
- Recognition and treatment of pneumothorax, haemothorax
- Pulmonary embolism: Index of suspicion, prevention/recognition and treatment
- Flail chest, stove in chest
- Postoperative pulmonary complication
- Empyema thoracis
- Recognition of oesophgeal atresisa and principles of management
- Neoplasms of the lung including its prevention by tobacco control
- Cancer oesophagus: principles of management including importance of early detection and timely referral to specialist
- Achalasia cardia
- Gastro-esophageal reflux disease (GERD)
- Congenital hypertrophic pyloric stenosis
- Aetiopathogenesis, diagnosis and management of peptic ulcer including role of H. Pylori and its diagnosis and eradication
- Cancer stomach
- Signs and tests of liver dysfunction
- Amoebic liver abscess and its non-operative management
- Hydatid cyst and its medical and surgical management including laparoscopic management
- Portal hypertension, index of suspicion, symptoms and signs of liver failure and

timely referral to a specialist center

- Obstructive jaundice with emphasis on differentiating medical vs surgical Jaundice, algorithm of investigation, diagnosis and surgical treatment options
- Neoplasms of liver
- Rupture spleen
- Indications for splenectomy
- Clinical features, diagnosis, complications and principles of management of cholelithiasis and cholecystitis including laparoscopic cholecystectomy
- Management of bile duct stones including endoscopic, open and laparoscopic management
- Carcinoma gall bladder, incidental cancer gallbladder, index of suspicion and its staging and principles of management
- Choledochal cyst
- Acute pancreatitis both due to gallstones and alcohol
- Chronic pancreatitis
- Carcinoma pancreas
- Peritonitis: causes, recognition, diagnosis, complications and principles of management with knowledge of typhoid perforation, tuberculous peritonitis, postoperative peritonitis
- Abdominal pain types and causes with emphasis on diagnosing early intra-abdominal acute pathology requiring surgical intervention
- Intestinal amoebiasis and other worms manifestation (Ascariasis) and their surgical complications (Intestinal Obstruction, perforation, gastrointestinal bleeding, involvement of biliary tract)
- Abdominal tuberculosis both peritoneal and intestinal
- Intestinal obstruction
- **Appendix:** Diagnosis and management of acute appendicitis
- Appendicular lump and abscess

Colon

- Congenital disorders, Congenital megacolon
- Colitis infective / non infective
- Inflammatory bowel diseases
- Premalignant conditions of large bowel
- Ulcerative colitis
- Carcinoma colon
- Principles of management of types of colostomy

Rectum and Anal Canal:

- Congenital disorders, Anorectal anamolies
- Prolapse of rectum

- Carcinoma rectum
- Anal Canal: surgical anatomy, features and management of fissures, fistula - in – ano.
- Perianal and ischiorectal abscess
- Haemorrhoids – Non-operative outpatient procedures for the control of bleeding (Banding, cryotherapy, injection) operative options - open and closed haemorrhoidectomy and stapled haemorrhoidectomy
- Anal carcinoma
- Clinical features, diagnosis, complication and principles of management of inguinal hernia including laparoscopic repair
- Umbilical, femoral hernia and epigastric hernia
- Open and Laparoscopic repair of incisional/primary ventral hernia
- Urinary symptoms and investigations of urinary tract
- Diagnosis and principles of management of urolithiasis
- Lower Urinary tract symptoms or prostatism
- Benign prostatic hyperplasia; diagnosis and management
- Genital tuberculosis in male
- Phimosis and paraphimosis
- Carcinoma penis
- Diagnosis and principles of treatment of undescendecd testis
- Torsion testis
- Hydrocele, haematocele and pyocele Varicocele: Diagnosis (Medical Board for fitness)
- Varicocele: Diagnosis (Medical Board for fitness)
- Acute and chronic epididymo-orchitis
- Testicular tumours
- Principles of management of urethral injuries
- Management of soft tissue sarcoma
- Prosthetic materials used in surgical practice
- Telemedicine, teleproctoring and e-learning
- Communication skills

A student should be expert in good history taking, physical examination, providing basic life support and advanced cardiac life support, common procedures like FNAC, Biopsy, aspiration from serous cavities, lumber puncture etc. The student should be able to choose the required investigations.

Clinical cases and Symptoms-based approach to the patient with:

1. Ulcers in oral cavity

2. Solitary nodule of the thyroid
3. Lymph node in the neck
4. Suspected breast lump
5. Benign breast disease
6. Acute abdominal pain
7. Blunt Trauma Abdomen
8. Gall stone disease
9. Dysphagia
10. Chronic abdominal pain
11. Epigastric mass
12. Right hypochrondium mass
13. Right iliac fossa mass
14. Renal mass
15. Inguino-scrotal swelling
16. Scrotal swelling
17. Gastric outlet obstruction
18. Upper gastrointestinal bleeding
19. Lower gastrointestinal bleeding
20. Anorectal symptoms
21. Acute intestinal obstruction
22. Obstructive jaundice
23. Acute retention of Urine
24. Bladder outlet obstruction
25. Haematuria
26. Peripheral vascular disease
27. Varicose veins
28. New born with developmental anomalies
29. Hydronephrosis , Pyonephrosis, perinephric abscess
30. Renal tuberculosis
31. Renal tumors
32. Carcinoma prostate
33. Genital tuberculosis in male

At the end of the course, post graduate students should be able to perform independently (including perioperative management) the following:

- Start IV lines and monitor infusions
- Start and monitor blood transfusion
- Venous cut-down
- Start and manage a C.V.P. line
- Conduct CPR (Cardiopulmonary resuscitation)

- Basic/ advance life support
- Endotracheal intubation
- Insert nasogastric tube
- Proctoscopy
- Urethral catheterisation
- Surgical management of wounds
- Biopsies including image guided
- Manage pneumothorax / pleural space collections
- Infiltration, surface and digital Nerve blocks
- Incise and drain superficial abscesses
- Control external hemorrhage
- Vasectomy (Preferably non-scalpel)
- Circumcision
- Surgery for hydrocele
- Surgery for hernia
- Surgery and Injection/banding of piles
- Management of all types of shock
- Assessment and management of burns
- Hemithyroidectomy
- Excision of thyroglossal cyst
- Excision Biopsy of Cervical Lymphnode
- Excision of benign breast lump
- Modified Radical mastectomy
- Axillary Lymphnode Biopsy
- Excision of gynaecomastia
- Excision of skin and subcutaneous swellings
- Split thickness skin graft
- Management of hernias
- Laparoscopic and open cholecystectomy
- Management of Liver abscess
- appendectomy
- Management of intestinal obstruction, small bowel resection, perforation and anastomosis
- Colostomy

The student must have observed or assisted (the list is illustrative) in the following:

- Hartmann’s procedure for cancer rectum
- Spleenectomy (emergency)
- Stomach perforation
- Varicose Vein surgery

- Craniotomy (Head Injury)
- Superficial parotidectomy
- Submandibular gland excision
- Soft tissue tumours including sarcoma
- Pancreaticoduodenal resection
- Hydatid cyst liver
- Pancreatic surgery
- Retroperitoneal operations

TEACHING AND LEARNING METHODS

Teaching methodology

Didactic lectures are of least importance; small group discussion such as seminars, journal clubs, symposia, reviews and guest lectures should get priority for theoretical knowledge. Bedside teaching, grand rounds, structured interactive group discussions and clinical demonstrations should be the hallmark of clinical/practical learning with appropriate emphasis on e-learning. Student should have hand-on training in performing various procedures and ability to interpret various tests/investigations. Exposure to newer specialized diagnostic/therapeutic procedures concerning her/his subject should be given. Self-learning tools like assignments and case-based learning may be promoted.

1. **Clinical postings**

   A major portion of posting should be in General Surgery. It should include in-patients, out-patients, ICU, trauma, emergency room and speciality clinics.

   Rotation of posting

   - Inter-unit rotation in the department should be done for a period of up to one year.
   - Rotation in appropriate related subspecialties for a total period not exceeding 06 months.

2. **Clinical meetings:**

   There should be intra- and inter- departmental meetings for discussing the uncommon /interesting cases involving multiple departments.

3. **Log book:** Each student must be asked to present a specified number of cases for clinical discussion, perform procedures/tests/operations/present seminars/review articles from various journals in inter-unit/interdepartmental teaching sessions. They should be entered in a Log Book. The Log books shall be checked and assessed periodically by the faculty members imparting the training.

4. **Thesis writing and research:**

   Thesis writing is compulsory.

5. The postgraduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.
6. A postgraduate student of a postgraduate degree course in broad specialities/super specialities would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.
7. The student should know the basic concepts of research methodology, plan a research project, be able to retrieve information from the library. The student should have a basic knowledge of statistics.
8. Department should encourage e-learning activities.

During the training programme, patient safety is of paramount importance; therefore, skills are to be learnt initially on the models, later to be performed under supervision followed by performing independently; for this purpose, provision of surgical skills laboratories in the medical colleges is mandatory.

ASSESSMENT

Assessment should be comprehensive & objective. It should address the stated competencies of the course. The assessment needs to be spread over the duration of the course.

FORMATIVE ASSESSMENT, i.e., assessment during the training would include:
Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self directed learning and ability to practice in the system.

General Principles

Internal Assessment should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills. The Internal Assessment should be conducted in theory and clinical examination.

Quarterly assessment during the MS training should be based on following educational activities:

1. **Journal based / recent advances learning**
2. **Patient based /Laboratory or Skill based learning**
3. **Self directed learning and teaching**

4. **Departmental and interdepartmental learning activity**
5. **External and Outreach Activities / CMEs**

The student to be assessed periodically as per categories listed in postgraduate student appraisal form (Annexure I).

SUMMATIVE ASSESSMENT, ie., assessment at the end of training

The summative examination would be carried out as per the Rules given in **POSTGRADUATE MEDICAL EDUCATION REGULATIONS, 2000.**

The examination will be in three parts:

1. **Thesis**

   Every post graduate student shall carry out work on an assigned research project under the guidance of a recognised Post Graduate Teacher, the result of which shall be written up and submitted in the form of a Thesis. Work for writing the Thesis is aimed at contributing to the development of a spirit of enquiry, besides exposing the candidate to the techniques of research, critical analysis, acquaintance with the latest advances in medical science and the manner of identifying and consulting available literature.

   Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination. The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination. A candidate shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners.

2. **Theory**

   The examinations shall be organised on the basis of ‘Grading’or ‘Marking system’ to evaluate and to certify candidate's level of knowledge, skill and competence at the end of the training. Obtaining a minimum of 50% marks in ‘Theory’ as well as ‘Practical’ separately shall be mandatory for passing examination as a whole. The examination for MS shall be held at the end of 3rd academic year. An academic term shall mean six month's training period.

   Theory shall consist of four papers of 3 hours each.

   Paper I: Basic Sciences

   Paper II: Principles and Practice of Surgery

   Paper III: Principles and practice of Operative Surgery

Paper IV: Recent Advances in Surgery

3. Clinical / Practical and viva voce Examination

Clinical examination shall be conducted to test the knowledge, skills, attitude and competence of the post graduate students for undertaking independent work as a specialist/Teacher, for which post graduate students shall examine a minimum one long case and two short cases.

The Oral examination shall be thorough and shall aim at assessing the post graduate student's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty, which form a part of the examination.

Assessment may include Objective structured clinical examination.(OSCE)

Oral/Viva-voce examination needs to assess knowledge on X-rays, instrumentation, operative procedures. Due weightage should be given to Log Book Records and day-to-day observation during the training.

Recommended Reading:

Books (latest edition)

1. *Text Book of Surgery*, by Christopher Davis
2. ASI Text Book of Surgery
3. *Surgery of Colon, Rectum and Anal canal*, by Goligher J C
4. Schwartz *Text Book of Surgery*
5. *Textbook on Laparoscopic Surgery*
6. *Trauma (Mattox)*
7. *Recent Advances in Surgery*
8. *Year Book of Surgery*
9. *Surgical Clinics of North America*
10. *Short practice of Surgery* by Bailey and Love
11. *A manual of clinical Surgery*, by S Das
12. Hamilton Bailey's demonstration of clinical signs
13. Pye's *Surgical Handicraft*

Journals

03-05 international Journals and 02 national (all indexed) journals

Annexure I

Postgraduate Students Appraisal Form
Pre / Para /Clinical Disciplines

Name of the Department/Unit :

Name of the PG Student :

Period of Training : FROM……TO……

Sr. No.	PARTICULARS	Not Satisfactory	Satisfactory	More Than Satisfactory	Remarks
		1 2 3	4 5 6	7 8 9	
1.	Journal based / recent advances learning				
2.	Patient based /Laboratory or Skill based learning				
3.	Self directed learning and teaching				
4.	Departmental and interdepartmental learning activity				
5.	External and Outreach Activities / CMEs				
6.	Thesis / Research work				
7.	Log Book Maintenance				

Publications **Yes/ No**

Remarks*_____
_____
_____
_____

***REMARKS: Any significant positive or negative attributes of a postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.**

SIGNATURE OF ASSESSEE **SIGNATURE OF CONSULTANT** **SIGNATURE OF HOD**

Medical Council Of India

NATIONAL MEDICAL COMMISSION
Postgraduate Medical Education Board

D 11011/1/22/AC/Guidelines/22 **Date: 02-11-2022**

National Medical Commission

GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR M.D. IN PATHOLOGY

GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR MD IN PATHOLOGY

Preamble

The purpose of PG education is to create specialists who would provide high quality health care and advance the cause of science through research & training.

This programme is meant to standardize Pathology teaching at postgraduate level throughout the country in order to achieve uniformity in teaching and create suitable manpower with appropriate expertise. The postgraduate student in pathology should be sufficiently trained, professionally competent and confident in handling, ~~and~~ processing, and diagnosis related to histopathology (surgical pathology), cytopathology, and hematology with reasonable working knowledge in blood banking, laboratory medicine, medical statistics, and ancillary techniques with understanding of general principles and methodology.

The purpose of this document is to provide teachers and learners illustrative guidelines to achieve defined outcomes through learning and assessment. This document was prepared by various subject-content specialists. The Reconciliation Board cum Expert group of NMC has attempted to render uniformity without compromise to the purpose and content of the document. Compromise in purity of syntax has been made in order to preserve the purpose and content. This has necessitated retention of "domains of learning" under the heading "competencies".

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SUBJECT SPECIFIC LEARNING OBJECTIVES

At the end of the MD training programme in Pathology, the student should achieve the following goals:

1. Knowledge of Pathology

1.1. Make a diagnosis based on histopathology (surgical pathology) and cytopathology specimens, blood and bone marrow examination and various tests of Laboratory Medicine (clinical pathology, clinical biochemistry) as well as Blood Banking (Transfusion Medicine).

1.2. Interpret clinical and laboratory data with reasonable accuracy and prepare a succinct and lucid report

1.3. Compose reports following standard protocols including synoptic reporting

1.4. Interpret and correlate clinical and laboratory data so that clinical manifestations of diseases can be explained.

1.5. Advise on the selection of appropriate specimens and tests necessary to arrive at a diagnosis in a problematic case including molecular tests.

1.6. Correlate clinical and laboratory findings with pathology findings at autopsy, identify miscorrelations and the causes of death due to diseases (apart from purely metabolic causes).

1.7. Maintain quality control of all tests by being part of Internal Quality Control Monitoring program.

1.8. Make and record observations systematically and maintain accurate records of tests and their results for reasonable periods of time. Identify problems in the laboratory, offer solutions thereof and maintain a high order of quality control.

1.9. Should be aware of safe and effective disposal of laboratory waste and ensure minimization risk of exposure to infection and accidents to laboratory personnel.

2. Teaching and training

2.1. Should be able to teach Pathology to undergraduates, postgraduates, nurses and paramedical staff including laboratory personnel.

2.2. The postgraduate student should be able to teach effectively and assess undergraduate medical and allied health science students so that they become competent healthcare professionals.

3. Research

3.1. Plan, execute, analyze, and present research work independently or as part of a team.

3.2. The postgraduate student in Pathology should acquire knowledge and skills to be able to conduct a research project from the planning to the publication stage and become a life-long learner.

4. Professionalism, Ethics and Communication skills

4.1. The postgraduate student should learn and apply principles of professionalism, ethics, and effective communication in conduct of routine pathology services, research, and routine work.

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SUBJECT SPECIFIC COMPETENCIES

A. COGNITIVE DOMAIN

A postgraduate student upon successfully qualifying the MD (Pathology) examination should have acquired the following BROAD theoretical competencies and should be:

- Capable of offering an accurate diagnostic opinion in a given clinical situation with an appropriate and relevant sample of tissue, blood, body fluid, etc. for the purpose of diagnosis.
- Conversant with the standard operating procedures of various laboratories including histopathology, cytopathology, hematology and laboratory medicine
- Able to teach and share his knowledge and competence with others. The student should be imparted training in teaching methods in the subject which may enable the student to take up teaching assignments in Medical Colleges/Institutes.
- Capable of pursuing clinical and laboratory-based research. He/she should be introduced to basic research methodology so that he/she can conduct fundamental and applied research.

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At the end of the course, **the student should have acquired the following competencies as a diagnostician:**

Surgical pathology

- Be conversant in the histogenesis and pathophysiological processes associated with various diseases.
- Should be able to identify problems in the histopathology laboratory and offer viable solutions.
- Possess the background knowledge necessary for the evaluation and reporting of Surgical Pathology.
- Conversant with the various equipment used in the histopathology laboratory.
- Should have knowledge of automation and quality assurance in histopathology.

Cytopathology

- Possess the background knowledge necessary for the evaluation and reporting of Cytopathology.

- Demonstrate familiarity with, and guide clinical/radiology residents in keeping with the clinical information on the choice of site, collection, preservation, transport, type of preparation and method of obtaining various cytological specimens.
- Conversant with the various equipment used in the cytopathology laboratory.
- Should have knowledge of automation and quality assurance in cytopathology.

Hematology

- Demonstrate ability to utilize the principles of the practice of Hematology for the planning of tests, interpretation, and diagnosis of diseases of the blood and bone marrow.
- Conversant with the various equipment used in the hematology laboratory.
- Should have knowledge of automation and quality assurance in hematology.

Laboratory medicine

- Demonstrate familiarity with the normal range of values of the chemical content of body fluids, significance of altered values, and interpretation thereof.
- Possess knowledge of the following specialized organ function tests and relative utility and limitations of each and significance of altered values:
  (i) Renal function test
  (ii) Liver function test
  (iii) Endocrine function test
  (iv) Tests for malabsorption
- Principles, advantage and disadvantages, scope, and limitation of automation in laboratory.
- Learn the principle and methodology of quality control in the laboratory.

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Transfusion medicine

- Possess knowledge of basic immunology, ABO and Rh groups, minor blood groups and their clinical significance, transfusion therapy, pre-transfusion testing, transfusion related infections, transfusion reactions and quality control in blood bank.

Autopsy pathology

- Conversant with the technique of autopsy.
- Possess sufficient understanding of the various disease processes so that meaningful clinico-pathological correlation can be made.

Immunopathology

- Demonstrate familiarity with current concepts of structure and function of the immune system, its aberrations, and mechanisms thereof.
- Demonstrate familiarity with the scope, principles, limitations, and interpretations of the results of ELISA techniques, HLA typing, immunofluorescence, and immunoelectrophoresis.

Immunohistochemistry and flow cytometry

- Demonstrate familiarity with the principles and procedures of performing immunohistochemistry including automation in procedure and interpretation.
- Demonstrate familiarity with the principles and procedures of performing flow cytometry.

Cytogenetics and Molecular biology

- Demonstrate familiarity with the principles of molecular biopsy especially related to the understanding of disease processes and its use in various diagnostic tests at least including but not limited to in-situ hybridization, polymerase chain reaction, Sanger Sequencing and Next generation sequencing.

Electron microscopy

- Demonstrate familiarity with the principles and techniques of electron microscopy and the working of the electron microscope.
- Demonstrate familiarity with the tissue processing and staining methods for electron microscopy, including immune-labelling techniques and use of semi-thin sections.

Enzyme histochemistry

- Demonstrate familiarity with the principles, use and interpretations of common enzyme histochemical procedures.

Quality Control

- Demonstrate familiarity with various quality control programmes running in the department, both internal and external quality.
- Demonstrate familiarity with inert and intra assay variations, batch variations, validation of chemicals and instruments.

Laboratory Safety and Good clinical lab practices

- Demonstrate familiarity with good lab practices and safety, record maintenance of capital equipment and consumables, purchase specifications, approximate costs of reagents and equipment, maintenance of store logbooks, etc.

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Biomedical Waste Management

- Demonstrate familiarity with disposal methods for each specimen, reagents, instruments, autoclaving techniques, recycling of products and e-waste.

At the end of the course, **the student should have acquired the following competencies as a <u>teacher:</u>**

- Demonstrate familiarity with different modes, methods, and principles of teaching including microteaching.

At the end of the course, **the student should have acquired the following competencies as a <u>researcher:</u>**

- Conversant with the principles of basic and applied research methodology, literature search, study design, sample size estimation, selection of controls, and appropriate application of medical statistics.
- Possess knowledge about the methods of writing thesis and/or a research paper with the prescribed instructions, as expected of international standards.
- Conversant with the use of digital slide imaging, algorithms to evaluate findings in imaging, morphometry, and application of artificial intelligence.

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B. AFFECTIVE DOMAIN

1. The student will show integrity, accountability, respect, compassion and dedicated patient care. The student will demonstrate a commitment to excellence and continuous professional development.
2. The student should demonstrate a commitment to ethical principles relating to providing patient care, confidentiality of patient information and informed consent.
3. The student should show sensitivity and responsiveness to patients' culture, age, gender and disabilities.
4. The student should demonstrate a commitment to ethical principles relating to research conduct and research publication.

C. PSYCHOMOTOR DOMAIN

1. Able to perform grossing of biopsy and surgical specimens including gross diagnosis and taking appropriate sections/ samples necessary for diagnosis, comprehensive staging, and ancillary testing.
2. Conversant in histopathology tissue processing techniques and troubleshooting, cutting of paraffin and frozen sections, making imprint smears, and staining, and immunohistochemistry.
3. Able to collect specimens by routinely performing non-invasive out-patient procedures such as venipuncture, finger-prick, fine needle aspiration of superficial lumps and bone-marrow aspirates, making smears and staining, and provide appropriate guidance to colleagues performing procedure such as a biopsy or an imaging guided biopsy including on-site microscopic assessment of specimen adequacy.
4. Perform an autopsy, dissect various organ complexes and display the gross findings.
5. Conversant with the function, handling, and routine care of equipment in the laboratory and quality assurance.
6. Able to teach and share his knowledge and competence with others. The student should be imparted training in teaching methods in the subject which may enable the student to take up teaching assignments in Medical Colleges/Institutes.
7. Able to pursue clinical and laboratory-based research. He/she should be introduced to basic research methodology so that he/she can independently conduct fundamental and applied research.

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Syllabus

Course contents:

It is difficult to give a precise outline of the Course Contents for post graduate training. A postgraduate is supposed to acquire not only the professional competence of a well-trained specialist but also academic maturity, a capacity to reason and critically analyze scientific data as well as to keep himself abreast of the latest developments in the field of Pathology and related sciences. The study of Anatomic Pathology includes all aspects of Pathology as encompassed in the branches of General and Systemic Pathology. Only the broad outlines are provided.

A. COGNITIVE DOMAIN

A) General Pathology:

Normal cell and tissue structure and function:

- The changes in cellular structure and function in diseases.
- Causes of disease, its pathogenesis, reaction of cells, tissues, organ systems, and the body to various sub lethal and lethal injuries.
- Cellular adaptation, cell injury, and cell death.
- Mechanism, morphology and examples of cell injury, necrosis, apoptosis, autophagy, and newer forms of cell death including necroptosis and pyroptosis.
- Sub cellular and cellular responses and adaptation to injury.
- Intracellular and intercellular accumulations, pathological calcification, and cell aging.

Acute and chronic inflammation:

- Vascular and cellular events in acute inflammation, chemical mediators, outcome, and morphological patterns of acute inflammation.
- Chronic inflammation with special reference to granulomatous inflammation.
- Systemic effects and effects of deranged inflammation.
- Tissue renewal and repair: Regeneration healing and fibrosis.
- Control of normal cell proliferation and tissue growth, mechanism of tissue regeneration, repair by healing and fibrosis.
- Extracellular matrix and cell matrix interactions.

Hemodynamic disorders, thromboembolic disease, and shock:

- Edema, hyperemia, congestion, and hemorrhage.
- Normal Hemostasis, thrombosis, DIC, embolism, infarction, and shock.

Genetic Disorders

- Principles of genetics, normal karyotyping.
- Mutations, Mendelian disorders, disorders with multifactorial inheritance cytogenetic disorders involving autosomes and sex chromosomes.
- Single gene disorders with nonclassic inheritance.
- Diagnosis of genetic disorders involving molecular and genetic techniques.

Neoplasia

- Definition, nomenclature, and biology of tumor growth
- Molecular basis of cancer with special reference to carcinogenic agents and molecular basis of multistep carcinogenesis.
- Epidemiology and clinical features of tumors.

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- Grading, staging and laboratory diagnosis of cancer.

Infectious Diseases

- Pathology and general principles of microbial pathogenesis, special techniques for diagnosing bacterial, fungal, parasitic, and viral infections.

Environmental and nutritional pathology

- Common environmental and occupational exposures leading on to diseases.
- Nutritional deficiencies and obesity related disorders.

Disease of Infancy and Childhood

- Congenital anomalies, birth injuries, diseases of neonates, inborn errors of metabolism, tumor, and tumor like lesions of infancy and childhood.

Immunopathology

- Innate immunity- Role of phagocytic cells, complement, mast cells & humoral mechanisms.
- Specific Acquired Immunity- Details about antibody production & action, Brief principles about memory, Ag specificity & vaccination.
- Cell involved in Immune response- T- Lymphocytes, B-lymphocytes, macrophages, dendritic cells, and natural-killer cells.
- Cytokines with details about their properties and functions.
- Structure and function of histocompatibility molecules and disease association.
- Disorders of the immune system.
- All hypersensitivity reactions.
- Autoimmune disorders with special reference to SLE, Rheumatoid arthritis, Sjogren's syndrome, systemic sclerosis, polyarteritis nodosa and other vasculitides, Mixed connective tissue disorders and inflammatory disorders.
- Immunodeficiency syndrome – Acquired with emphasis on AIDS.
- Amyloidosis including pathogenesis, special stains & clinical correlation.
- Transplant rejection in detail.
- Graft vs Host Disease.

B) Systemic Pathology:

The study of normal structure and function of various organ systems and the etiopathogenesis, gross and microscopic alterations of structure of these organ systems in disease and functional correlation with clinical features.

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Blood vessels, lymphatic and veins

- Normal morphology, congenital anomalies, atherosclerosis, hypertensive vascular disease.
- Inflammatory and neoplastic diseases of all the vessels.

Heart

- Normal morphology, its blood supply and effect of aging on heart.
- Ischemic, Hypertensive, valvular, congenital heart diseases.
- Cardiomyopathies
- Myocardial disorders
- Pericardial diseases.
- Tumors of the heart.

Lungs and Mediastinum

- Congenital anomalies
- Obstructive and restrictive pulmonary diseases
- Diseases of vascular origin
- Infections of Lung
- Infections of Mediastinum
- Tumors of lung
- Lung transplantation
- Diseases of pleura
- Thymus – Developmental, autoimmune, and inflammatory disorder and tumors.

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Head and Neck

- Oral cavity: - inflammatory disease, Preneoplastic lesions and tumors.
- Diseases of teeth and supporting structures.
- Upper airways and ear – congenital anomalies, infections, and tumors.
- Salivary glands – Infections autoimmune disorders and tumors.

Gastrointestinal Tract

- Congenital anomalies, infections, inflammatory and vascular disorders and tumors of esophagus, stomach, small and large intestines, appendix, and anal canal.
- Diseases of the peritoneum, Omentum and Mesentery Retroperitoneum.
- Inflammatory and neoplastic lesions.

Liver

- Normal morphology with general features of hepatic disease including LFTs.
- Infectious, autoimmune drug induced metabolic and circulatory disorders of liver.

- Hepatic diseases associated with pregnancy, neonates, organ and bone marrow transplantation.
- Liver transplantation pathology.
- Cysts, Nodules, and tumors of liver.

Biliary tract

- Congenital anomalies, injuries, Infection, inflammation, of Gallstones and tumors of gall bladder and extra hepatic bile ducts. Pancreas.
- Congenital anomalies, pancreatitis, and neoplasms of pancreas.

Kidney

- Clinical manifestations of renal diseases
- Congenital anomalies
- Diseases affecting glomeruli, tubules, interstitium and blood vessels.
- Cystic diseases of kidney
- Nephrolithiasis
- Tumors of kidney
- Kidney Transplant pathology

Lower urinary tract and male genital system

- Congenital anomalies, inflammation and tumors of bladder, ureter, urethra, penis, testis, epididymis, and Scrotum.
- Inflammation, enlargement, and tumors of prostate.

Female genital tract

- Physiology, cytology and histology of female genital tract, menstrual disorders, and hormonal abnormalities.
- Congenital anomalies, inflammation, preneoplastic and neoplastic lesions of vulva, vagina, cervix, uterus, fallopian tubes, ovaries and mesonephron.
- Gestational and placental disorders.

Breast

- Inflammations, benign epithelial lesions, and tumors of the breast.
- Diseases of male breast.

Endocrine System

- Normal hormonal levels and functions of all the endocrine glands.
- Hypo and hyperactivity of glands of endocrine system i.e., pituitary, thyroid, parathyroid, pancreas, adrenals, and pineal gland.

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- Autoimmune diseases, inflammations and tumors affecting these glands,
- Neuroendocrine tumors,

Skin and Subcutaneous tissue

- Disorders of pigmentation and melanocytes,
- Inflammatory, vesiculobullous, and infectious disease,
- Proliferative lesions and Tumors of the epidermis, dermis, and skin appendage.

Musculoskeletal system

- Bone Modelling, growth, and development, genetic and acquired abnormalities in bone cells, matrix and structure, factures, necrosis and infections of bones, tumors and tumor-like lesions,
- Joints: Arthritis, tumor, and tumor-like lesions.
- Soft tissue: Tumors and tumor=like lesions.

Peripheral nerves and skeletal muscles

- General reactions of motor units.
- Inflammatory, infectious, hereditary, metabolic, and traumatic neuropathies.
- Atrophy, dystrophy, myopathies of the skeletal muscles.
- Diseases of neuromuscular junction.
- Tumors of peripheral nerves and skeletal muscles.

Skull and Central Nervous System

- Degenerative, metabolic, toxic, demyelinating, infectious, cerebrovascular malformations, and traumatic injuries.
- Tumors.

Eye and Orbit

- Infections, inflammatory, congenital diseases and neoplasms of orbit, eyelid, conjunctiva sclera, uvea, cornea, retina, and optic nerves.

C) Hematology and Transfusion medicine

The study of Hematology includes all aspects of the diseases of the blood and bone marrow. This would involve the study of the normal, and the causes of diseases and the changes thereof.

Biology of stem cell and Hematopoiesis

- Overview of stem cell biology and cellular biology of hematopoiesis.
- Transcription factors and humoral regulation in normal and malignant hematopoiesis.
- Interaction between hematopoietic stem cells, progenitor cell and stromal compartment of bone marrow.

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- Stem cell homing & mobilization.

Erythroid maturation, differentiation, and abnormality

- Pathobiology of human erythrocyte & Hemoglobin Anemia.
- Approach to anemia in adults and children in: Clinical correlation & diagnostic modalities.
- Classification of anemias (Morphological, pathophysiological, and based on erythropoiesis i.e., proliferative vs non-proliferative).
- Iron deficiency anemia including iron metabolism and differential diagnosis from other microcytic hypochromic anemias.
- Disorder of iron metabolism including iron overload.
- Anemia of chronic disorders with special reference to infections, collagen vascular disorders, inflammation etc.
- Megaloblastic anemia and other causes of megaloblastosis.
- Definition, approach, and classification of hemolytic anemia.
- Lab diagnosis of Hemoglobin disorders and hereditary anemia like Thalassemia and related hemoglobinopathies, sickle cell anemia.
- Hemoglobin associated with altered Oxygen affinity.
- Red blood cell enzymopathy, membrane disorder, autoimmune hemolytic anemia, non-immune hemolytic anemia, paroxysmal nocturnal hemoglobinuria.
- Approach to Pancytopenia/ Cytopenia.
- Bone marrow failure syndrome.
- Porphyria.

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WBC disorders, complement and immunoglobin biology

- Normal granulopoiesis.
- Acquired and congenital disorders of phagocytosis (neutrophil, monocyte, eosinophil, and macrophages.
- Disorder of leukocyte number, function, and morphology.

Storage disorder

Hematological responses to Infections

- Viral disorders - Infectious mononucleosis, Hepatitis, and dengue.
- Parasitic infections - Malaria, Kala azar.

Hematological malignancies

- Conventional & molecular cytogenetic and immunohistochemical basis of hematological malignancies.

- Classification (WHO, ICC).
- Their basis and diagnostic approach to various hematological malignancies.
- Pathophysiology, prognostic factors, cytochemistry, cytogenetics of various leukemias.
- Pathophysiology and classification of MDS, MPN/MDS, myeloproliferative disorders.
- Pathophysiology of Non-Hodgkin's lymphoma, Clinical staging of Hodgkin's lymphoma.
- Role of molecular cytogenetics and immunohistochemistry in Hodgkin's and Non-Hodgkin's lymphoma and lymphoproliferative disorders.
- AIDS related and Transplant related lymphomas.
- Plasma cell dyscrasias and gammopathies.
- Mastocytosis.
- Role of chemotherapy and antineoplastic agents based on molecular mechanism of hematological malignancies, clinical use of hematopoietic growth factors.

Hematopoietic stem cell transplantation

- Role and indications of HST, immunodeficiency state, hematological Malignancies and Non-hematological disorders.
- Practical aspect of umbilical cord stem cells transplantation.
- Peripheral stem cell collection.
- Role of stem cell in tissue repair.
- Complications of Hematopoietic stem cell transplant.
- Gene therapy and genetic engineering.

Prenatal diagnosis of genetic hematological diseases

Hemostasis & Thrombosis

- Megakaryocyte and platelet structure.
- Molecular basis of platelet function, activation.
- Role of blood vessel, coagulation system and fibrinolytic system in hemostasis.
- Clinical and lab evaluation of bleeding and coagulation disorders.
- Clinical & diagnostic aspects of factor deficiencies including hemophilia, von Willebrand disease, DIC, Vitamin K deficiency.
- Thrombotic and non-thrombotic purpura.
- Hereditary and acquired platelet disorders and its management.
- Thrombophilia (Inherited & acquired).
- Lab evaluation and management of hypercoagulable states.

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Human blood group antigen and antibody and Immuno-hematology

- Selection of donor and screening..
- Principle, indication and storage of red blood cells, WBC, platelet, and plasma transfusion.
- Various methods of component separation and plasma derivatives with special reference to Fresh frozen plasma, cryo-precipitates, platelet concentrate, single donor plasma, albumin, and Immunoglobulin.
- Graft Rejection, GVH diseases, Transfusion Reactions, Blood grouping & cross matching.
- Blood bank audit.
- Apheresis

Hematological manifestations of systemic diseases

- Liver disorders, renal disorders, infections, cancers, parasitic diseases, AIDS, pregnancy, and surgical patients.

Spleen and its disorders

D) Laboratory Medicine (Clinical Pathology including Parasitology)

- Principles of testing, indications, values with ranges in normal and diseased states in relation to:
    - Liver function tests
    - Renal function tests
    - Endocrine function tests
    - Body fluid analysis including stool, urine, semen, CSF, etc.
- Principles of laboratory automation, trouble shooting, and quality assurance.

D) Special techniques

The student is expected to acquire a general acquaintance of techniques and principles and to interpret data in the following fields:

- Immunopathology,
- Electron microscopy,
- Histochemistry,
- Immunohistochemistry,
- Cytogenetics and in-situ hybridization,
- Molecular Biology,
- Digital Pathology and image analysis,

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- Maintenance of records,
- Information retrieval, use of Computer and Internet in medicine.

E) Instrumentation and automation

- Principles, indications, working, maintenance, and troubleshooting of equipment used in various laboratories:
    - Histopathology laboratory – Histopathology tissue processor, microtome, water batch, embedding station, Stainer, IHC Stainer, ultramicrotome, etc.
    - Microscopes – Immunofluorescence, FISH, Confocal, Electron, etc.
    - Cytopathology Laboratory – Centrifuge, Cytocentrifuge, Cytospin apparatus, liquid-based cytology, etc.
    - Hematology Laboratory – automated cell counter, flow cytometer, coagulometer, HPLC, Electrophoresis apparatus, immunoblot, etc.
    - Clinical Pathology –Photoelectric colorimeter, Spectrophotometer, pH meter, Centrifuge, Electrophoresis apparatus, ELISA Reader, chemiluminescence, etc.
    - Digital pathology – Whole slide scanners
    - Molecular pathology – PCR, Sanger sequencer, NGS sequencers, etc.
- Automation in Pathology.
- Good lab practices and safety, record maintenance of capital equipment and consumables, purchase specifications, approximate costs of reagents and equipment, maintenance of store logbooks, etc.

F) Quality assurance program

- Internal and external quality assurance methods.
- Intra assay variations, batch variations, validation of chemicals and instruments.

G) Establishment Act and Rules and regulations formed by Govt. or regulatory bodies

H) Biomedical Waste management

- Disposal methods for each specimen, reagents, instruments, autoclaving techniques, recycling of products and e-waste.

I) Biostatistics, Research Methodology and Clinical Epidemiology

J) Ethics and Medico legal aspects relevant to Pathology

K) Current topics and recent advances in pathology

B. PSYCHOMOTOR DOMAIN

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Demonstrate following predominant Psychomotor domain competencies		
Sr. No.	Competency	Perform under supervision/ perform independently/ Observation only
I.	HISTOPATHOLOGY (SURGICAL PATHOLOGY)	
1.	Given the clinical and operative data, identify and systematically and accurately describe the chief gross anatomic alterations in the surgically removed specimens and be able to correctly diagnose common lesions received on an average day from the surgical service of an average teaching hospital	Independently
2.	Perform a systematic gross examination of the tissues including the taking of appropriate tissue sections and in special cases as in intestinal mucosal biopsies, muscle biopsies and nerve biopsies, demonstrate the orientation of tissues in paraffin blocks.	Independently
3.	Identify and systematically and accurately describe the chief histo-morphological alterations in the tissue received in the surgical pathology service. He/she should also correctly interpret and correlate with the clinical data to diagnose routine surgical material received on an average day.	Independently
4.	Identify common problems in histopathology processing techniques (poor fixation, delayed fixation, poor staining, etc.,) including automated tissue processing machine troubleshooting and rectify common problems	Independently
5.	Operate and maintain common equipment in the histopathology laboratory such as microtome, water bath, cryostat, tissue processor, auto Stainer, etc.	Perform under supervision
6.	Process a tissue, make a paraffin block and cut sections of good quality on a rotary microtome	Perform under supervision
7.	Stain paraffin sections with hematoxylin and eosin stain and common special stains needed for diagnosis	Independently
8.	Cut a frozen section, stain and interpret the slide in correlation with the clinical data provided	Independently

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9.	Standardize and validate new antibodies for immunohistochemistry with understanding of controls, clones, and dilutions	Independently
10.	Perform immunohistochemistry on paraffin sections using manual method	Independently
11.	Identify common problems in immunohistochemistry procedure (artifacts, inadequate retrieval, section floating, IHC failure, etc.,) and rectify such problems	Independently
12.	Decide on the appropriate immunohistochemical panels for diagnosis, prognosis and predictive purposes in common disease conditions based on standard recommendations and interpret their results	Independently
13.	Write histopathology reports, including synoptic reports, wherever needed, following protocols and international standards. The reports should be succinct and lucid, with clinical notes and advice, as necessary.	Independently
II	CYTOPATHOLOGY	
1.	Perform fine needle aspiration of superficial lumps and make good quality smears including collection of material for cell block preparation and decide on the type of fixative and stain in a given case	Independently
2.	Prepare and stain good quality smears for cytopathological examination	Independently
3.	Provide appropriate guidance to colleagues performing procedure such as a biopsy or an imaging guided biopsy including on-site microscopic assessment of specimen adequacy.	Independently
4.	Decide on the technique of collection, preservation, transport and concentration of various exfoliative cytology specimens (such as filters, centrifuge, liquid-based cytology, cytospin, etc.)	Independently
5.	Perform on-site adequacy assessment in image guided sampling procedures and decide on sample triage for routine diagnosis (type of preparation, stain, etc.) and ancillary tests including microbiological and molecular tests	Independently
6.	Diagnose common cases received in a routine cytopathology laboratory and categorize them into negative, inconclusive and positive, using the correct technique of screening and dotting the slides	Independently

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	for suspicious cells, correctly identify the type of tumor, if present, and the presence of organisms, fungi and parasites, if present	
7.	Perform preparations (cytospin smears, liquid-based cytology, cell blocks, etc.) of common cytological samples using equipment such as centrifuge, cytocentrifuge and liquid based cytology apparatus	Observation only
III	HEMATOLOGY	
1.	Perform venipuncture for peripheral blood collection and decide on appropriate collection tubes, storage, and anticoagulant based on indication	Independently
2.	Prepare good quality peripheral blood smears, stain and report peripheral blood counts and other findings including reticulocyte and platelet counts on cell counter and manually	Independently
3.	Perform bone marrow aspirates and biopsy, prepare good quality smears and imprints	Perform under supervision
4.	Perform bone marrow aspirate staining including stain for iron	Independently
5.	Perform cytochemical characterization of leukemia with special stains on bone marrow aspirates	Perform under supervision
6.	Perform and interpret coagulation profile including PT, APTT and FDP	Independently
7.	Perform and interpret sickling test and osmotic fragility test	Independently
8.	Describe accurately the morphologic findings in the peripheral and bone marrow smears, identifying and quantitating the morphologic abnormalities in disease states and arriving at a correct diagnosis in at least common cases referred to the Hematology clinic, given the relevant clinical data	Independently
9.	Given the clinical data, interpret the results of i. Red cell indices ii. Plasma hemoglobin iii. Hemosiderin in urine iv. Hemolytic anemia profile including HPLC, Hb electrophoresis etc. v. Hemoglobin and serum protein electrophoresis vi. Clotting time and other point of care tests for bleeding	Independently

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	vii. G6PD enzyme estimation viii. Platelet function tests including platelet aggregation and adhesion and PF3 release ix. Russell's viper venom time (RVVT) x. Coagulation Factor assays xi. Serum Fibrinogen xii. Screening for coagulation factor inhibitor, Bethesda Assay, xiii. Fibrin Degradation Products (FDP), D-Dimers xiv. Monitoring of anti-coagulant therapy xv. Thrombophilia profile (Lupus anticoagulant (LAC), Anticardiolipin Antibody (ACA), Activated Protein C Resistance (APCR), Protein C (Pr C), Protein S (Pr S) and Antithrombin III (AT III)) xvi. Serum ferritin, Serum iron and total iron binding capacity	
10.	Interpret flow cytometry findings in the immunophenotyping of leukemia, CD34 enumeration, CD 3/CD 19 enumeration, PNH work up, etc.	Independently
11.	Interpret results of cytogenetics and molecular diagnostics in the work up of hematological diseases	Independently
12.	Prepare samples as appropriate for the indication, and operate equipment such as automated cell counter, flow cytometry, coagulometers, HPLC and electrophoresis apparatus	Observation only
IV	LABORATORY MEDICINE	
1.	Plan a strategy of laboratory investigation of a given case, given the relevant clinical history and physical findings in a logical sequence, with a rational explanation of each step; be able to correctly interpret the laboratory data of such studies, and discuss their significance with a view to arrive at a diagnosis.	Independently
2.	Perform urine analysis including physical, chemical and microscopic, examination of the sediment as well as by Dipstick methods.	Independently
3.	Perform macroscopic and microscopic examination of feces and identify the ova and cysts of common parasites.	Independently

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4.	Perform a complete examination: physical, chemical and cell content of Cerebrospinal Fluid (C.S.F), pleural and peritoneal fluid	Independently
5.	Perform semen analysis and interpret results in the context of clinical and hormone findings	Independently
6.	Perform quantitative estimation of blood/serum by automated techniques for common biochemical tests	Independently
7.	Prepare standard solutions and reagents relevant to common biochemical tests including the preparation of normal solution, molar solution and buffers	Independently
8.	Interpret and report common laboratory biochemical tests (LFT, KFT, endocrine function tests) with understanding of clinical implications	Independently
9.	Operate, maintain and troubleshoot common equipment used such as photoelectric colorimeter, Spectrophotometer, pH meter, Centrifuge, Electrophoresis apparatus, ELISA Reader, PCR, chemiluminescence, etc.	Perform under supervision
V	TRANSFUSION MEDICINE	
1.	Perform selection and bleeding of donors, ABO and Rh grouping and cross match, antibody screening and titer, selection of blood for exchange transfusion	Independently
2.	Resolve ABO grouping problems and outline measures for investigation of transfusion medicine	Independently
3.	Perform and interpret anti-globulin test in antenatal and neonatal work up	Independently
4.	Prepare blood components such as cryoprecipitates, platelet concentrates, fresh frozen plasma, single donor plasma, red blood cell concentrates, etc. and test blood for presence of pathogens including HBV, HCV, HIV, VDRL, Malaria, etc.	Observation only
VI	AUTOPSY	
1.	Perform an autopsy, dissect various organ complexes, and display the gross findings (Note: An improvised autopsy may also be arranged in places where full autopsy is not possible. Relevant organs from wet specimens in the museum with appropriate clinical history may be arranged for a detailed description and diagnosis. At least ten such	Independently (see Note)

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	improvised autopsies may be discussed by each candidate during the entire duration of the course)	
2.	Provide Provisional and Final Anatomic Diagnosis report, major findings correctly and systematically at autopsy, and the Autopsy Protocol as per prescribed instructions.	Independently
VII	MOLECULAR BIOLOGY	
1.	Interpret results of Polymerase Chain Reaction (PCR), real time PCR, Sanger Sequencing in a given clinical context.	Independently
2.	Interpret results of in-situ hybridization (fluorescent and chromogenic) in a given clinical context	Independently
3.	Prepare sample by appropriate methods and perform Polymerase Chain Reaction (PCR), real time PCR, Sanger Sequencing, and in-situ hybridization including troubleshooting	Observation only
VIII	IMMUNOPATHOLOGY	
1.	Interpret direct/ indirect immunofluorescence results in the context of common diseases of the skin, medical renal diseases and autoimmune diseases	Independently
2.	Prepare sample by appropriate methods and perform indirect immunofluorescence on a frozen section from skin/ renal biopsy	Perform under supervision
IX	ELECTRON MICROSCOPY	
1.	Interpret transmission electron microscopy results in common non-neoplastic and neoplastic diseases	Independently
2.	Prepare specimen by appropriate methods and process tissue for electron microscopy, interpret semi-thin sections and view ultra-thin sections under electron microscope	Observation only
X.	DIGITAL PATHOLOGY	
1.	Navigate and annotate whole slide scanned images	Independently
2.	Select and scan slides for digitalization and perform basic image analysis functions such as length measurements, enumeration, etc.	Observation only
XI.	TEACHING	
1.	Demonstrate different methods of teaching-learning and assessments	Independently
2.	Engage and teach undergraduates and paramedical staff in the form of small group teaching and demonstrations	Independently

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3.	Engage in peer teaching in the form of presenting seminars and journal clubs and be able to use different modes of teaching including PowerPoint projections and charts	Independently
XII.	RESEARCH	
1.	Write the thesis (and/or a scientific paper) in accordance with the prescribed instructions, as expected of international standards	Independently

TEACHING AND LEARNING METHODS

General principles

Acquisition of competencies being the keystone of doctoral medical education, such training should be skills oriented. Learning in the program, essentially autonomous and self-directed, and emanating from academic and clinical work, shall also include assisted learning. The formal sessions are meant to supplement this core effort.

All students joining the postgraduate (PG) courses shall work as full-time (junior) residents/demonstrators during the period of training, attending not less than 80% of the training activity during the calendar year, and participating in all assignments and facets of the educational process. They shall maintain a logbook for recording the training they have undergone, and details of the procedures done during laboratory and clinical postings in real time. Maintenance of e-records of such procedures is encouraged.

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The three-year training programme for the MD degree may be arranged in the form of postings to different assignments/laboratories for specified periods as outlined below. The period of such assignments/postings is recommended for 36 months with breaks only for examinations and mandatory postings. Posting schedules may be modified depending on needs, feasibility and exigencies. For facilities not available in the parent institution as well as for additional knowledge and skill, extramural postings may be undertaken. Departments may vary the postings slightly based on the clinical profile of the hospital, within the time period bands given below, however at least the lower limit for each of the four main components of the course must be covered during postings.

Posting schedule is given below:

S. No	Section/ Subject	Duration in months
(i)	Surgical Pathology, Autopsy, Immunohistochemistry	11-16
(ii)	Hematology, Laboratory Medicine, and Blood bank	8-10
(iii)	Cytopathology	6-9
(iv)	Basic Sciences, Immunopathology, Cytogenetics, Electron microscopy, Molecular Biology etc. and Research Techniques including Thesis	2-6
	Total	**36 (including exam)**

Teaching-Learning methods

This should include a judicious mix of demonstrations, symposia, journal clubs, clinical meetings, seminars, small group discussion, case-based learning, simulation-based teaching, self-directed learning, integrated learning, interdepartmental meetings, and any other collaborative activity with the allied departments. Methods with exposure to the applied aspects of the subject relevant to basic/clinical sciences should also be used. **The suggested examples of teaching-learning methods are given below but are not limited to these. The frequency of various below mentioned teaching-learning methods can vary based on the subject's requirements, competencies, workload and overall working schedule in the concerned subject. The Pathology resident is expected to sit in reporting every day, having seen the slides the previous day with written descriptions, which should be evaluated daily by the reporting faculty. This is the mainstay of training in all disciplines of Pathology.**

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A. Lectures: Didactic lectures should be used sparingly. A minimum of 10 lectures per year in the concerned PG department is suggested. Topics to be selected as per subject requirements All postgraduate trainees will be required to attend these lectures. Lectures can cover topics such as:

1. Subject related important topics as per specialty requirement
2. Recent advances
3. Research methodology and biostatistics
4. Salient features of Undergraduate/Postgraduate medical curriculum
5. Teaching and assessment methodology.

Topic numbers 3, 4, 5 can be done during research methodology/biostatistics and medical education workshops in the institute.

B. Journal club: Minimum of once in 1-2 weeks is suggested.

Topics will include presentation and critical appraisal of original research papers published in peer reviewed indexed journals. The presenter(s) shall be assessed by faculty and grades recorded in the logbook.

C. Student Seminar: Minimum of once every 1-2 weeks is suggested.

Important topics should be selected as per subject requirements and allotted for in-depth study by a postgraduate student. A teacher should be allocated for each seminar as faculty moderator to help the student prepare the topic well. It should aim at comprehensive evidence-based review of the topic. The student should be graded by the faculty and peers.

D. Student Symposium: Minimum of once every 3 months.

A broad topic of significance should be selected, and each part shall be dealt by one postgraduate student. A teacher moderator should be allocated for each symposium and moderator should track the growth of students. The symposium should aim at an evidence-based exhaustive review of the topic. All participating postgraduates should be graded by the faculty and peers.

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E. Laboratory work/ Interactive slide and gross sessions: Minimum - once every 1-2 weeks.

Laboratory work, slide and gross specimen teaching sessions should be coordinated and guided by faculty from the department. Various methods like case-based discussions, oral or written quiz, etc. are to be used. Faculty from the department should participate in moderating the teaching-learning sessions.

F. Interdepartmental colloquium

Faculty and students must attend monthly meetings between the main Department and other department/s on topics of current/common interest or clinical cases. This includes institutional activities such as clinical combined rounds (CCR), clinic-pathological correlation conferences (CPC), and departmental activities like autopsy conferences.

G. a. Rotational clinical / community / institutional postings

Depending on local institutional policy and the subject specialty needs, postgraduate trainees may be posted in relevant departments/ units/ institutions. The aim would be to acquire more in-depth knowledge as applicable to the concerned specialty. Postings would be rotated

between various units/departments and details to be included in the specialty-based Guidelines. Few examples are listed below:

- Laboratory-based specialty units/departments e.g. Biochemistry / Microbiology/ Infection control unit/Laboratory Medicine, Hematology, Blood bank, Transplantation Immunology, Forensic Medicine, Proteomics, etc.
- Medical Education Unit (MEU) or Department of Medical Education (DOME): optional

G. b. Posting under "District Residency Programme" (DRP):

All postgraduate students pursuing MS/MS in broad specialties in all Medical Colleges/Institutions shall undergo a compulsory rotation of three months in District Hospitals/District Health System as a part of the course curriculum, as per the Postgraduate Medical Education (Amendment) Regulations (2020). Such rotation shall take place in the 3rd or 4th, or 5th semester of the Postgraduate programme and the rotation shall be termed as "District Residency Programme" and the PG medical student undergoing training shall be termed as "District Resident".

Every posting should have its defined learning objectives. It is recommended that the departments draw up objectives and guidelines for every posting offered in conjunction with the collaborating department/s or unit/s. This will ensure that students acquire expected competencies and are not considered as an additional helping hand for the department / unit in which they are posted. The PG student must be tagged along with those of other relevant departments for bedside case discussion/basic science exercises as needed, under the guidance of an assigned faculty.

Opportunities to present and discuss infectious disease cases through bedside discussion and ward/grand rounds with specialists / clinicians in different hospital settings must be scheduled to address antimicrobial resistance issues and strategies to deal with it.

H. Teaching research skills

Writing a thesis should be used for inculcating research knowledge and skills. All postgraduate students shall conduct a research project of sufficient depth to be presented to the University as a postgraduate thesis under the supervision of an eligible faculty member

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of the department as guide and one or more co-guides who may be from the same or other departments.

In addition to the thesis project, every postgraduate trainee shall participate in at least one additional research project that may be started or already ongoing in the department. It is preferable that this project will be in an area different from the thesis work. For instance, if a clinical research project is taken up as thesis work, the additional project may deal with community/field/laboratory work. Diversity of knowledge and skills can thereby be reinforced.

I. Training in teaching skills

MEU/DOME should train PG students in education methodologies and assessment techniques. The PG students shall conduct UG classes in various courses and a faculty shall observe and provide feedback on the teaching skills of the student.

J. Logbook

During the training period, the postgraduate student should maintain a Logbook indicating the duration of the postings/work done in Wards, OPDs, Casualty and other areas of posting. This should indicate the procedures assisted and performed and the teaching sessions attended. The logbook entries must be done in real time. The logbook is thus a record of various activities by the student like: (1) Overall participation & performance, (2) attendance, (3) participation in sessions, (4) record of completion of pre-determined activities, and (5) acquisition of selected competencies.

The purpose of the Logbook is to:

a) help maintain a record of the work done during training,
b) enable Faculty/Consultants to have direct information about the work done and intervene, if necessary,
c) provide feedback and assess the progress of learning with experience gained periodically.

The Logbook should be used in the internal assessment of the student, should be checked and assessed periodically by the faculty members imparting the training. The PG students will be required to produce completed logbook in original at the time of final practical examination. It should be signed by the Head of the Department. A proficiency certificate from the Head

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of Department regarding the clinical competence and skillful performance of procedures by the student will be submitted by the PG student at the time of the examination.

The PG students shall be trained to reflect and record their reflections in logbook particularly of the critical incidents. Components of good teaching practices must be assessed in all academic activity conducted by the PG student and at least two sessions dedicated for assessment of teaching skills must be conducted every year of the PG program. The teaching faculty are referred to the MCI Logbook Guidelines uploaded on the Website.

K. Course in Research Methodology

All postgraduate students shall complete an online course in Research Methodology within six months of the commencement of the batch and generate the online certificate on successful completion of the course.

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Other aspects

- The Postgraduate trainees must participate in the teaching and training program of undergraduate students and interns attending the department.
- Trainees shall attend accredited scientific meetings (CME, symposia, and conferences) at least once a year.
- Department shall encourage e-learning activities.
- The Postgraduate trainees should undergo training in Basic Cardiac Life Support (BCLS) and Advanced Cardiac Life Support (ACLS).
- The Postgraduate trainees must undergo training in information technology and use of computers.

During the training program, patient safety is of paramount importance; therefore, relevant clinical skills are to be learnt initially on the models, later to be performed under supervision followed by independent performance. For this purpose, provision of skills laboratories in medical colleges is mandatory.

ASSESSMENT

FORMATIVE ASSESSMENT, i.e., assessment to improve learning

Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self-directed learning and ability to practice in the system.

General Principles

Internal Assessment should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills. The Internal Assessment should be conducted in theory and practical/clinical examination, should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills.

Quarterly assessment during the MD training should be based on:

- Case presentation, case work up, case handling/management : once a week
- Laboratory performance : twice a week
- Journal club : once a week
- Seminar : once a fortnight
- Case discussions : once a fortnight/month
- Interdepartmental case or seminar : once a month

Note: These sessions may be organized and recorded as an institutional activity for all postgraduates.

- Attendance at Scientific meetings, CME programmes (at least 02 each)

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The student to be assessed periodically as per categories listed in appropriate (non-clinical/clinical) postgraduate student appraisal form (Annexure I).

SUMMATIVE ASSESSMENT, i.e., assessment at the end of training

Essential pre-requisites for appearing for examination include:

1. **Logbook** of work done during the training period including rotation postings, departmental presentations, and internal assessment reports should be submitted.

2. At least **two presentations** at state/national level conference. One paper (thesis or non-thesis related work) should be published /accepted/publication draft in an indexed journal.

The summative examination would be carried out as per the Rules given in the latest POSTGRADUATE MEDICAL EDUCATION REGULATIONS. The theory examination shall be held in advance before the Clinical and Practical examination, so that the answer books can be assessed and evaluated before the commencement of the clinical/Practical and Oral examination**.**

The postgraduate examination shall be in three parts**:**

1. **Thesis**

   Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination. The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination. A post graduate student in broad specialty shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners**.**

2. **Theory examination**

   The examinations shall be organized based on 'Grading 'or 'Marking system' to evaluate and to certify post graduate student's level of knowledge, skill, and competence at the end of the training, as given in the latest POSTGRADUATE MEDICAL EDUCATION REGULATIONS. Obtaining a minimum of 50% marks in 'Theory' as well as 'Practical' separately shall be mandatory for passing examination. The examination for M.D./ M.S shall be held at the end of 3rd academic year.

   There shall be four theory papers (as per PG Regulations).

   Paper I: Basic sciences as applied to the subject (general pathology, pathophysiology, immunopathology, and molecular biology).

   Paper II: (Systemic pathology – surgical and cytopathology).

   Paper III: (Hematology, transfusion medicine and laboratory medicine including instrumentation and quality control).

   Paper IV: Recent advances in the subject.

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The papers should have ideally one (01) structured long answer question which will evaluate comprehensive in-depth knowledge and 6-8 short answer questions.

3. Practical/clinical and Oral/viva voce examination

Practical examination

Practical examination should be spread at least over **two** days for each student and include various major components of the syllabus focusing mainly on the psychomotor domain.

Oral/Viva voce examination on defined areas should be conducted by each examiner separately. Oral examination shall be comprehensive enough to test the post graduate student's overall knowledge of the subject focusing on psychomotor and affective domain.

The final clinical examination in broad specialty clinical subjects should include:

- Cases pertaining to major systems (e.g., one long case and three short cases),
- Stations for laboratory, procedural and communication skills,
- Logbook Records and reports of day-to-day observation during the training,
- It is emphasized that Oral/viva voce examination shall be comprehensive enough to test the post graduate student's overall knowledge of the subject.

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The practical examination in Pathology should follow general guidelines outlined below which may be modified according to local university guidelines and should be spread over at least two days. The following marks distribution is suggested:

Practical 500 marks (including 100 marks for internal assessment)

Section I: Histopathology: 150 marks

- Slides (12-15)
- Grossing/autopsy
- Long case (write a full description with clinical information provided) and/or 2 biopsy cases with ancillary tests reporting (written work only, no viva)

Section II: Cytopathology and histo/cyto techniques: 80 marks

- Slides (5-8)
- Histo/Cyto techniques
- Special stain exercise

- Immunopathology, OSPE, EM

Section III: Hematology, transfusion medicine and clinical pathology: 120 marks

- Slides
- Exercises
- Case study
- Blood bank
- Clinical pathology exercises and OSPE

Section IV: Viva, basic sciences, and communication skills: 50 marks

- Pedagogy/thesis presentation
- Oral viva
- Basic Sciences

Details of exercises in individual sections are given below:

I. Clinical Pathology:

- Discussion of a clinical case history.
- Plan relevant investigations of the above case and interpret the biochemistry findings.
- Two investigations should be performed including at least one clinical pathology exercise like CSF, pleural tap etc. analysis and complete urinalysis.

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II. Haematology:

- Discuss hematology cases given the relevant history. Plan relevant investigations.
- Perform complete hemogram and at least two tests preferably including one coagulation exercise.
- Identify electrophoresis strips, osmotic fragility charts etc., interpretation of data from auto analyzers, HPLC and flow cytometry.
- Examine, report, and discuss around ten cases given the history and relevant blood smears and/or bone marrow aspirate smears and bone marrow biopsy interpretation.

III. Transfusion Medicine:

- Perform blood grouping
- Perform the necessary exercise like cross matching.
- Coomb's test, gel cards interpretation.

IV. Histopathology and cytopathology:

- Examine, report, and discuss 12-15 cases histopathology and 5-8 cytopathology cases, given the relevant history and slides.
- Perform a Hematoxylin and Eosin stain and any special stain on a paraffin section. Should be conversant with histopathology techniques including cryostat.
- Long case (write a full description with clinical information provided) and/or 2 biopsy cases with ancillary tests reporting

V. Autopsy:

- Given a case history and relevant organs (with or without slides), give a list of anatomical diagnosis in an autopsy case.

VI. Gross Pathology

- Describe findings of gross specimens, give diagnosis, and identify the sections to be processed. The post graduate student should perform grossing in front of the examiners for evaluation.

VII. Basic Sciences:

- 10-15 spots based on basic sciences be included
- Identify electron micrographs
- Identify gels, results of PCR, immunological tests including interpretation of Immunofluorescence pictures, etc.
- Identify histochemical and immuno-histochemistry stains

VIII. Teaching exercise

- Teach on a small topic for about 10 min or present dissertation and research
- General Viva-Voce (Grand Viva) – structured viva may be done separately or combined with above exercises

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Recommended Reading:

Books (latest edition)

1. Histology for Pathologists. Stephen S. Sternberg (Ed), Raven Press, New York.
2. Robbin's Pathologic Basis of Disease Ramzi S.Cotran, Vinay Kumar, Stanley L Robbins WB Saunders Co., Philadelphia.
3. Ackerman's Surgical Pathology. Juan Rosai Mosby. St. Louis.
4. Diagnostic Surgical Pathology. Stephen S Sternberg. Lippincott, William Wilkins. Philadelphia.

5. Diagnostic Histopathology of Tumours. Christopher DM Fletcher (Ed). Churchill Livingstone. Edinburgh.
6. Manual & Atlas of Fine Needle Aspiration Cytology. Svante R Orell, et al London.
7. Theory and Practice of Histological Techniques, Bancroft JD, Stevens A, Turner DR, Churchill Livingstone, Edinburgh.
8. Diagnostic Cytology and its Histopathologic Basis, Koss LG, J.B. Lippincott, Philadelphia.
9. Comprehensive Cytopathology, Bibbo M, W.B. Saunders Co., Philadelphia.
10. Wintrobe's Clinical Hematology, Lee GR, Foerster J, Lupeus J, Paraskevas F, Gveer JP, Rodgers GN, Williams & Wilkins, Baltimore.
11. Atlas and Text of Hematology 4th edition. Singh T. Avichal Publishing Company.
12. Dacie and Lewis Practical Hematology, Bain BJ, Bates I, Laffan MA. Elsevier.
13. Bone Marrow Pathology, Bain BJ, Clark DM, Lampert IA, Blackwell Science, Oxford.
14. Henry's clinical diagnosis and management by laboratory methods.
15. WHO classification of tumors. IARC Lyon.

Journals

03-05 international Journals and 02 national (all indexed) journals.

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Annexure I

Student appraisal form for broad specialty non-clinical disciplines

	Elements	Less than Satisfactory			Satisfactory			More than satisfactory			Comments
		1	2	3	4	5	6	7	8	9	
1	**Scholastic aptitude and learning**										
1.1	Has knowledge appropriate for level of training										
1.2	Participation and contribution to learning activity (e.g., Journal Club, Seminars, CME etc)										
1.3	Conduct of research and other scholarly activity assigned (e.g Posters, publications etc)										
1.4	Documentation of acquisition of competence (eg Log book)										
1.5	Performance in work based assessments										
1.6	Self-directed Learning										
2	**Work related to training**										
2.1	Practical skills that are appropriate for the level of training										
2.2	Respect for processes and procedures in the work space										
2.3	Ability to work with other members of the team										
2.4	Participation and compliance with the quality improvement process at the work environment										

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2.5	Ability to record and document work accurately and appropriate for level of training										
3	**Professional attributes**										
3.1	Responsibility and accountability										
3.2	Contribution to growth of learning of the team										
3.3	Conduct that is ethically appropriate and respectful at all times										
4	**Space for additional comments**										
5	**Disposition**										
	Has this assessment pattern been discussed with the trainee?	Yes	No								
	If not explain.										
	Name and Signature of the assesse										
	Name and Signature of the assessor										
	Date										

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NATIONAL MEDICAL COMMISSION
Postgraduate Medical Education Board

D 11011/1/22/AC/Guidelines/14 **Date: 05-08-2022**

GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR MD IN PAEDIATRICS

GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR MD IN PAEDIATRICS

PREAMBLE

The purpose of any postgraduate (PG) education is to train an individual, in this case a qualified MBBS doctor, to achieve competencies across all domains that enables the student to perform the professional role as an expert and specialist practicing a specialty in the community (Newborn to adolescent care; ambulatory and in-patient care; Well child/Healthy and Ill child; health promotion, disease prevention and curative care; individual and family centered care; emergency care, Intensive and routine Care). The shift towards competency-based medical education by Medical Council of India and continued by the National Medical Commission (NMC) focuses education to be outcome based, emphasizing abilities, balancing domains of learning and promoting a learner centered ownership of the curriculum.

The practice of medicine has and will continue to change. Existing changes in the environment and practice have included an explosion of information, stress on knowledge at the expense of skills/attitudes/critical thinking, increased access of information and health delivery systems by lay public, development and access to sub-specialties, technological and IT advances, costs of management (diagnostic and therapeutic), changes in disease trends (non-communicable diseases, behavioral/developmental disorders, malignancies, immunology, etc.), medico-legal litigations, emphasis on quality standards, improved patient safety, violence/anger against health personnel and the emergence of professional-ethical dilemmas to name a few.

The NMC's competency based education is organized using a framework of competencies (predefined abilities) that forms the backbone of the curriculum as defined outcomes. These competencies are defined as observable abilities of a health professional, integrating multiple components across all domains, cognitive, psychomotor skills, and affective. Identified competencies are to be measured and assessed to ensure their acquisition which in turn determines competence. Defined competencies in each domain facilitates education progressing from being a novice towards mastery with formative assessments (feedback) vital for success. Every domain will have weightage and the phenomenon of allowing the ability in one should not be allowed to compensate the lack of ability in another.

These changes are reflected in the review of Core Competencies keeping them mostly aligned with CBME Undergraduate efforts. Each competency will require Sub-competencies/milestones enabling both student and teacher monitor progress that is transparent making both accountable. Specific Learning Objectives that will be necessary to achieve (and assess) outcomes are certainly also required to complete the process. This document has been prepared by subject-content specialists of NMC. The Expert Group of the NMC had attempted to render uniformity without compromise to the purpose and content of the document. Compromise in purity of syntax has been made in order to preserve the purpose and content. This has necessitated retention of "domains of learning" under the heading "competencies

SUBJECT SPECIFIC OBJECTIVES

Goal

The goal of the MD Paediatrics post-graduate course on successful completion, is to mould the individual into a qualified Pediatrician who is a specialist doctor with the ability (competence) to assess the state of health; promote health; and diagnose as well as manage disease (acute or chronic, emergency or routine) in children of all ages from newborn to the adolescent.

Their expertise includes dealing with medical and surgical conditions of varied degrees of complexities providing a spectrum of care from prevention, promotion, resuscitation, emergency care, acute care, chronic care and procedures (diagnostic and therapeutic) including providing palliative care. Unlike in most adults, children go through changes in growth and development leading to anatomical, behavioral, and developmental changes that emphasizes that the Specialist incorporates this dynamic requirement into screening, assessments, diagnostic and therapeutic decisions. They will continue to play an important part in the health of the family and community especially through education and support of prevention of disease and health promotion since Paediatrics is child-centered and family-focused given the relationships and social structures of families. Pediatricians will also continue to provide consultative services to many other physicians across the specialties including Emergency, Burns, Plastic Surgery, Anesthesiologist, Surgeons, Infectious Disease, Community and Family Medicine.

SUBJECT SPECIFIC OBJECTIVES

The objectives of the postgraduate course (MD) in Paediatrics are to produce a competent pediatrician who:

- Acquires competencies relevant to all aspects of Paediatrics (newborn to adolescent) that are essential to function as a clinical expert in providing newborn and pediatric health services for the community at all levels.
- Recognizes the holistic health needs of healthy neonates, infants, children, and adolescents
- Performs responsibilities of the provision of clinical care in keeping with principles of the National Health Policy.
- Performs responsibilities in a professional and ethical manner.
- Acquires skills in effectively communicating not only with the health team but with the child, family, and the community
- Is actively involved in keeping oneself up to date with scientific advances in Paediatrics and Medicolegal aspects of practice.
- Is oriented to principles of research methodology enabling critical appreciation of published scientific evidence and contributing through scholarship
- Acquires skills to enable education of all stakeholders including health team members
- Acquires skills and understanding of dealing with health team members enabling optimizing system-based practice.

SUBJECT SPECIFIC COMPETENCIES

Towards achieving suitable outcomes certain Competencies are essential to be achieved, assessed that will enable the qualified professional to perform the role of a Paediatric Specialist.

Aligned with the NMC's existing Undergraduate CBME, the following are refined and identified as themes or roles mandatory to perform the responsibility as a Pediatric Specialist in the community after acquiring an MD Paediatric post-graduation:

1. Clinical Expert
2. Communicator

3. Professional
4. Scholar
5. Team Member

Core Competencies

(The term 'children' is hereby used to include all age groups from birth to 18 years - newborn, neonates, infants, toddlers, children and adolescents)

To perform each of these above roles as a Paediatrician, every role determines competencies which in turn requires Specific Learning Objectives covering all the domains of learning.

By the end of the MD Paediatric course, the postgraduate student should be able to:

1. Clinical Expert

1.1. Appreciate and recognize maternal and child health needs in the context of the health priority of the country at all levels ie. Individual, Community, Local, Regional, and National.

1.2. Apply an understanding of the determinants of child health at individual, community, and population levels in practice of disease prevention, health promotion and clinical care of all children.

1.3. Understand the existing inequities in accessibility to child friendly health, economics of child health and existing status of child health across gender, communities, region, and nation (eg. NHFS survey).

1.4. Participate in population/community efforts towards prevention, promotion, and disease control relevant and with implications for child health (ie. National Health Programs).

1.5. Appreciate and recognize the importance of nurturing care for the early growth and development as the very foundation of Paediatrics and help each child realize her/his optimal growth and development potential.

1.6. Actively support the optimization of quality of growth, development, and holistic health of children in care through education enhancing the promotive, preventive, and curative measures.

1.7. Provide continuum of care and rehabilitation for children afflicted by chronic disease.

1.8. Scientific Knowledge and Evidence

1.8.1. Apply an understanding of scientific basis, concepts, principles, and advances as the basis of health and disease in the screening, diagnosis, and management of all children including growth and development.

1.9. Clinical History/Examination

1.9.1. Demonstrate appropriate proficiency in basic clinical skills appropriate for children, ie. History, Physical Examination and Assessments of Growth/ Development/ Behavior, in arriving at the most likely clinical differential; in identifying precipitating or predisposing factors; prioritizing high risk versus low-risk conditions; and, those in need of emergency versus routine care.

1.9.2. Organize and analyze an authentic history and relevant examination towards a valid clinical assessment of health of all children including growth, development, and behavioral assessments.

1.10. Investigations

1.10.1. Order rational Investigations and interpret results keeping in mind cost effectiveness and purpose in child health (ie., confirming diagnosis that impacts management decisions).

1.11. Procedures/Interventions

1.11.1. Order, perform with safety and interpret results of procedures/ interventions that are cost-effective for diagnostic and therapeutic purposes in child health.

1.12. Critical Thinking

1.12.1. Demonstrate a logical clinical approach to diagnose children in health and disease in all settings.

1.12.2. Manage using appropriate resources all children in health and disease in settings not less than secondary level facilities

1.12.3. Demonstrate clinical reasoning at every step from gathering, organization, prioritization, analysis and creating logical diagnostic hypothesis from clinical data relevant to childhood (history to examination to investigations)

1.12.4. Formulate rational, judicious, and cost-effective plans (Investigation, Therapeutic and Counseling/Education plans) for all children in health and disease (acute and chronic) taking into consideration individual/ family circumstances, interpersonal dynamics, socioeconomic status, vulnerabilities, epidemiology, and population health factors.

1.12.5. Choose investigations and prescribes medications/interventions that are rational and cost-effective balancing benefits and costs in child health in the context of family status.

1.12.6. Critically appreciate scientific literature especially relevant to children under their care.

1.13. Responsiveness

1.13.1. Rapidly assess/screen, recognize and manage critically ill sick children prioritized for immediate attention.

1.13.2. Demonstrate sensitivity and appreciate the emotional and behavioral characteristics and needs of children while dealing with them

1.14. Quality of Care

1.14.1. Demonstrate practices that maximize child safety

1.14.2. Optimize safe working practices in child health delivery settings

1.14.3. Participate in incident reporting of adverse events and errors enabling quality improvement of child health

1.14.4. Participate in continuous Child Health Care related Quality Improvement measures especially patient related audits, recognition of gaps and implementation of interventions to improve quality

1.15. Advocacy

1.15.1. Responding to a Child's health needs by advocating for them

1.16. Documentation

1.16.1. Maintain Child health records of relevant demographic details clinical details, progress, interpretations, educational, monitoring and management decisions accurately and neatly organized

1.16.2. Provide relevant concise summaries and certification in completeness to authorized legal guardians of children

1.16.3. Maintain childhood morbidity and mortality data for audit purposes.

2. Communicator

2.1. Effective Communication

2.1.1. Demonstrate all aspects of effective and empathetic communication during most encounters with children and parents/guardians (listening skills, culturally appropriate verbal and non-verbal cues, simple understandable

language, allow questions, clarify answers and concise written communications for prescriptions and patient education)

2.1.2. Demonstrate mutually respectful communications with children/parents/guardians (verbal, telephonic, electronic and written) that is collaborative and effective between health system colleagues of all levels.

2.2. Effective Counselling

2.2.1. Provide professional assistance and guidance in assisting children/parents/ authorized legal guardians determine their autonomous decisions regarding their own health (especially related Diagnostic Interventions and Therapeutic options).

3. Professional

3.1. Responsibility

3.1.1. Demonstrate responsibility for all aspects of the conduct of child care, academic tasks and research in children undertaken.

3.1.2. Demonstrate social accountability consistent with community and professional expectations through active participation in child health relevant Community Outreach programs

3.1.3. Demonstrate an understanding of one's own limits and seeks assistance appropriately in dealing with children in health and disease.

3.2. Integrity

3.2.1. Demonstrate commitment with honesty for consistent and uncompromising adherence to moral and ethical principles and values in protecting child rights and wellbeing during care, academics, and research.

3.3. Compassion and empathy

3.3.1. Demonstrate the ability to understand and share the feelings of children and families while dealing with them as care providers.

3.3.2. Demonstrate the ability to understand and share the feelings of health team members while working with them for the good of children.

3.4. Stigma and Discrimination

3.4.1. Demonstrate ability to comprehend the differences in values and beliefs while respectfully continuing child health care without discrimination

3.5. Ethical principles

3.5.1. Recognize ethical conflicts specific for child health between principles of ethics and justifies options/decisions while discussing within health care team discussions.

3.5.2. Demonstrate respect for confidentiality in issues related to child health.

3.5.3. Demonstrate ability to honor the doctor-child/parent/legal guardian relationship in all dealings with respect ensuring due care especially avoiding all inappropriate behavior and activities that lead to conflicts of interest.

3.5.4. Demonstrate mutual respect for all members on the child health team and behaves equitably and collaboratively while dealing with them.

3.5.5. Demonstrate prioritization of child's welfare and community benefits over self when appropriate.

3.6. Medicolegal Law and Code of Ethics

3.6.1. Practice within the NMC's standards as prescribed by the Code of Ethics especially in dealings with children.

3.6.2. Practice within the Law of the land fulfilling legal requirements during the provision of care especially relevant to children.

4. Scholar

4.1. Research

4.1.1. Refer to evidence-based guidelines in the decision-making process for child care justifying limitations.

4.1.2. Understand research methodology and the creation of a research studies for child health.

4.1.3. Demonstrate the ability to critically appreciate the quality and implications of scientific literature justifying its application in the delivery of child health care.

4.1.4. Demonstrate an ability to identify pertinent research questions relevant to child health through active participation and involvement in research.

4.2. Academics

4.2.1. Demonstrate features of active adult learning through enthusiasm and displaying a positive attitude in the educational process while participating in educational activities to build child health care capacities (Intra- and inter-institutional).

4.2.2. Use appropriate educational techniques to promote health education amongst children/parents/legal guardians/community

4.2.3. Use appropriate educational techniques to facilitate learning of other child health care team members including undergraduates, nurses, paraclinical staff and peers

4.2.4. Maintain competency by keeping up to date with child health guidelines through continued medical education with scientific knowledge and skills to enable quality practice

4.3. Application

4.3.1. Apply child health expertise in an area of study that is published in academic journals

4.3.2. Apply child health expertise while participating in health education and community efforts

5. Team Member

5.1. Teams

5.1.1. Demonstrate an understanding of the roles and competencies of other health care providers dealing with child health.

5.1.2. Demonstrate the ability to engage and collaborate with all child health care team members keeping the patient at the center of all such collaboration.

5.1.3. Recognize and discuss in a non-judgmental way the roles of informal stakeholders as extended teams especially in child care planning (especially mature adolescent, extended family, alternative medicine practitioners, support networks, etc.)

5.1.4. Demonstrate knowledge of health care financing, implications for management and its application in assisting patient to access the best possible care through extended team networking while dealing with child health.

5.1.5. Maintain personal health and wellbeing not only of self but of team members.

5.2. Leaders

5.2.1. Demonstrate leadership and management skills enabling effective working as a child health team

5.2.2. Lead, manage, and participate as a member of an effective and efficient child health care team while collaborating respectfully either as leader or member.

5.2.3. Facilitate child health team capacity building of competencies by leading through conduct of effective education sessions for members of the health team learning.

5.2.4. Manage time and human resources efficiently and effectively to deliver optimal child health care.

SYLLABUS

Syllabus gives an outline and summary of topics to be covered in the MD Paediatric Course.

In Competency Based Education, outcomes are required to be defined, taught, learnt, and assessed that determines competence at the end of the course. Defined Outcomes should focus on what is expected practically in the "real world" by the professional performing roles of the expert physician. This syllabus is focused on all age group of children from neonates to toddlers to children to adolescents as per existing practice. The syllabus thus stresses on "real world presentation of symptoms and signs" and is categorized under the following:

A. Cognitive Domain
    a. Basic Sciences
    b. Approaches/Management of common symptoms/signs inclusive of analysis, interpretation, and application of investigations
    c. Specific Topics classified as per traditional systems
B. Psychomotor Domain
C. Affective Domain
D. Pedagogic and Research Skills

A) Predominant in Cognitive (Knowledge) Domain

a. Basic Sciences

- *Should be able to justify and apply in the practice of Paediatrics, an understanding of the fundamentals of basic sciences as listed below:*

1. Applied Anatomy

1.1. Embryogenesis of all organ systems
1.2. Central Nervous System

1.2.1. Structures, Functions, Clinical considerations

1.2.1.1. Cerebral Cortex
1.2.1.2. Corticospinal tracts
1.2.1.3. Extrapyramidal tracts
1.2.1.4. Cerebellar connections
1.2.1.5. Sensory tracts
1.2.1.6. Ventricles

1.3. Spinal Cord, Peripheral Nerves

1.3.1. Structures, Functions, Clinical considerations

1.3.1.1. Lower Motor Neuron

1.4. Bladder and Bowel control
1.5. Vascular supply – Principal arteries and veins
1.6. Extremities, Abdomen, Thorax, Head and Neck
1.7. Fetal circulation

2. Physiological basis and Pathophysiology in Health and Disease

2.1. Physical Growth
2.2. Temperature regulation
2.3. Acid Base Balance
2.4. Fluid Balance
2.5. Hematopoiesis
2.6. Hemostasis
2.7. Electrolyte balance
2.8. Bone mineralization: Calcium-Phosphate balance
2.9. Puberty
2.10. Renal function
2.11. Hepatic function
    2.11.1. Bilirubin
    2.11.2. Drug metabolism
2.12. Respiratory function
2.13. Cardiac function
2.14. Gastrointestinal
2.15. Endocrine functions
2.16. Developmental Milestones
2.17. Adolescence
2.18. Placenta functions
2.19. Fetal to Infant Transitions (Cardio-respiratory)
2.20. Nutrition
2.21. Allergy

3. Biochemical basis of health and disease

3.1. Cell biology
    3.1.1. Cell cycle
    3.1.2. Cell signaling
3.2. CHO metabolism
3.3. Lipid metabolism
3.4. Protein metabolism
3.5. TCA Cycle
3.6. Hemoglobin
3.7. Clinical Chemistry
    3.7.1. Vitamins
    3.7.2. Minerals
3.8. Plasma Proteins
3.9. Coagulation Pathway

4. Genetics and Molecular Medicine

4.1. Human Genome
4.2. Nucleic acids

4.2.1. Protein synthesis

4.3. Recombinant DNA Technology

4.3.1. Basic techniques
4.3.2. Applications

4.4. Chromosomal abnormalities

4.4.1. Pedigree charting

4.5. Prenatal/Postnatal diagnosis
4.6. Immunogenetics

4.6.1. HLA

5. Clinical Microbiology

5.1. Virology

5.1.1. Classifications
5.1.2. Diagnostics
5.1.3. Therapeutics
5.1.4. Resistance

5.2. Bacteriology

5.2.1. Classification
5.2.2. Endo/Exotoxins
5.2.3. Diagnostics
5.2.4. Therapeutics
5.2.5. Resistance
5.2.6. Antibiotic Stewardship

5.3. Mycology

5.3.1. Classification
5.3.2. Diagnostics
5.3.3. Therapeutics
5.3.4. Resistance

5.4. Parasitology (Protozoology and Helminthology)

5.4.1. Classification
5.4.2. Diagnostics
5.4.3. Therapeutics
5.4.4. Resistance

5.5. Waste disposal, sterilization, disinfection

5.5.1. Infection Control

6. Immunology

6.1. Immune response system

6.1.1. Innate, Adaptive
6.1.2. Cellular
6.1.3. Antibodies
6.1.4. Cytokines
6.1.5. Clinical considerations

6.2. Immunoglobulins

6.2.1. Types
6.2.2. Clinical considerations

6.3. Complement

6.3.1. Components
6.3.2. Pathways
6.3.3. Deficiencies
6.3.4. Clinical considerations

6.4. Hypersensitivity reactions

6.5. Blood group Immunology

6.5.1. ABO
6.5.2. Rh
6.5.3. Minor groups

6.6. Immunological assays

6.7. Science of Vaccinology

6.7.1. Vaccines
6.7.2. Classification
6.7.3. Schedule
6.7.4. Indications, contraindications
6.7.5. Adverse effects
6.7.6. Catch up doses

6.8. Immunodeficiency

6.8.1. Primary
6.8.2. Secondary

6.9. Autoimmune disease

6.9.1. Basis
6.9.2. Autoantibodies
6.9.3. Clinical considerations

6.10. Transplant Immunology

6.10.1. Stem cell
6.10.2. GVH disease
6.10.3. Solid organ transplant

6.11. Cancer Immunology

7. Pharmacology

7.1. Pharmacokinetics – common medications
7.2. Antimicrobials
7.3. Analgesia, sedation
7.4. Drug interactions
7.5. Adverse effects
7.6. Antidotes for poisons
7.7. Drug induced disease

8. Epidemiology

8.1. Rates
8.2. Principles of study design
8.3. Measures of effects
8.4. Association and causation
8.5. Diagnostic tests

9. Statistics

9.1. Distribution of data
9.2. Measures of Central tendency
9.3. Measures of dispersion
9.4. Probability distributions
9.5. Sampling
9.6. Statistical significance

10. Professionalism and Ethics

10.1. Professionalism

10.1.1. Clinical competencies
10.1.2. Effective communication
10.1.3. Understanding of Ethics
10.1.4. Accountability
10.1.5. Altruism
10.1.6. Excellence
10.1.7. Humanism

10.2. Ethics

10.2.1. Code of ethics
10.2.2. Principles of Ethics
10.2.3. Ethical workup
10.2.4. Doctor-Patient relationship
10.2.5. Confidentiality and privacy
10.2.6. Doctor-Doctor relationship

10.3. Medico-legal essentials

10.3.1. POSCO
10.3.2. Certifications
10.3.3. Documentation
10.3.4. Informed consent
10.3.5. MLC formalities

11. Pedagogy

11.1. How adults learn
11.2. Competencies and Specific Learning Objectives
11.3. Teaching Learning Methodologies
11.4. T-L Media including Power Point Presentations
11.5. Assessments- Formative and Summative

12. Management

12.1. Time Management
12.2. Conflict Management
12.3. Communication especially Listening

12.4. How to study – Lectures? Wards? Journal club?
12.5. Fundamentals of Counselling
12.6. Stress Management
12.7. Teamwork
12.8. Leadership

b. Approaches/Management of common symptoms/signsinclusive of analysis, interpretation, and application of investigations *(In every age group from newborn to adolescent)*

- ***Approaches*** *(Clinical and Investigation) of the following clinical symptoms/ signs*

Management *plans (Investigation, Treatment, Care, Counselling, Education, Follow Up, Rehabilitation Plans) of healthy children (section 1.1) and children with the following clinical symptoms/signs.*

1.1. Healthy Children

1.1.1. Healthy neonate
1.1.2. Healthy infant
1.1.3. Healthy child
1.1.4. Healthy adolescent

1.2. Cardiovascular Symptoms/Signs

1.2.1. Murmurs
1.2.2. Cyanosis
1.2.3. Syncope
1.2.4. Dizziness
1.2.5. Breathlessness
1.2.6. Palpitations
1.2.7. Chest Pain

1.3. Development (and Behavioral) Symptoms/ Signs

1.3.1. Normal development
1.3.2. Delayed milestones
1.3.3. Regression of milestones
1.3.4. Unusual behaviors
1.3.5. Poor scholastic performance
1.3.6. Deviations in sexuality
1.3.7. Dysmorphic features
1.3.8. Suicide attempt
1.3.9. Behavioral issues -disinterest, isolation, poor social interaction
1.3.10. Substance abuse
1.3.11. Abnormal eating behavior
1.3.12. Sleep disturbance
1.3.13. Breath holding spells
1.3.14. Multiple unexplained unrelated complaints
1.3.15. Technology dependence
1.3.16. Speech abnormalities

1.4. Dermatology

1.4.1. Neonatal skin lesions
1.4.2. Infantile skin lesions
1.4.3. Acquired skin rashes in childhood
1.4.4. Urticaria
1.4.5. Neurocutaneous presentations

1.5. Emergencies

1.5.1. Dehydration
1.5.2. Respiratory distress
1.5.3. Hypoxia
1.5.4. Shock
1.5.5. Incessant crying
1.5.6. Sick looking
1.5.7. Status epilepticus
1.5.8. Acute Severe Asthma
1.5.9. Trauma
1.5.10. Animal/human bite
1.5.11. Abuse
1.5.12. Cardio-pulmonary failure
1.5.13. Oliguria/Anuria
1.5.14. Raised intracranial pressure
1.5.15. Coma
1.5.16. Traumatic Brain Injury
1.5.17. Acute poisoning
1.5.18. Envenomation
1.5.19. Medico-legal conditions

1.6. Endocrine Symptoms

1.6.1. Abnormal stature
1.6.2. Hypoglycemia
1.6.3. Delayed puberty
1.6.4. Precocious puberty
1.6.5. Goiter

1.7. **Gastrointestinal (and Hepatic) Symptoms**

1.7.1. Tongue tie
1.7.2. Vomiting and regurgitation
1.7.3. Diarrhea – Acute
1.7.4. Diarrhea – Chronic, persistent, recurrent
1.7.5. Abdominal pain – Acute
1.7.6. Abdominal Pain - Recurrent
1.7.7. Constipation
1.7.8. Jaundice
1.7.9. Gastrointestinal bleed
1.7.10. Hepatomegaly
1.7.11. Splenomegaly
1.7.12. Hepatosplenomegaly
1.7.13. Encopresis
1.7.14. Abdominal distention

1.7.15. Abnormal Liver Function tests

1.8. Genital Symptoms

1.8.1. Atypical or ambiguous genitalia
1.8.2. Menstrual abnormalities
1.8.3. Injuries to genitalia
1.8.4. Foreskin, penile problems
1.8.5. Labial adhesions

1.9. Growth (and Nutrition related) Symptoms

1.9.1. Normal growth
1.9.2. Normal diet
1.9.3. Poor feeding in Infancy
1.9.4. Undernutrition
1.9.5. Failure to thrive
1.9.6. Overweight and obesity

1.10. Hematological Symptoms

1.10.1. Pallor
1.10.2. Bleeding manifestations
1.10.3. Lymphadenopathy
1.10.4. Thrombotic manifestations
1.10.5. Abnormal Hematological parameters including Pancytopenia

1.11. **Infectious (and Immunological) Symptoms**

1.11.1. Fever with focus
1.11.2. Fever without focus
1.11.3. Fever - persistent or recurrent
1.11.4. Exanthematous Fever
1.11.5. Recurrent infections
1.11.6. Hospital acquired infection
1.11.7. Vaccination Issues– complete, incomplete

1.12. Metabolic Symptoms

1.12.1. Acidosis – metabolic, respiratory
1.12.2. Alkalosis – metabolic, respiratory
1.12.3. Mixed Acid-Base disturbance
1.12.4. Dyselectrolytemia – Hypo/Hypernatremia, Hypo/Hyperkalemia, Hypo/hypercalcemia
1.12.5. Hyperammoniaemia
1.12.6. Hypoglycemia

1.13. **Musculoskeletal Symptoms**

1.13.1. Joint pains with or without swelling
1.13.2. Low back pain
1.13.3. Deformities of bone growth
1.13.4. Scoliosis

1.13.5. Growing Pains involving lower limbs

1.14. Neonatology

1.14.1. Term gestation
1.14.2. Prematurity
1.14.3. Low birth weight
1.14.4. Neonatal Jaundice
1.14.5. Ill/Sick
1.14.6. Neonatal seizures
1.14.7. Neonatal respiratory distress
1.14.8. Neonatal Apnea
1.14.9. Neonatal Shock
1.14.10. Metabolic/electrolyte disturbances – Glucose, Sodium, Potassium, Calcium, Bicarbonate, Lactate, Ammonia
1.14.11. Feed Intolerance
1.14.12. Spinal/Cranial abnormalities
1.14.13. Post NICU follow up
1.14.14. HIV-HepB-Syphilis exposure/infection
1.14.15. Inadequate breast milk
1.14.16. Antenatal detected renal abnormalities

1.15. **Neurological Symptoms**

1.15.1. Seizures
1.15.2. Altered sensorium/Coma
1.15.3. Motor weakness
1.15.4. Incessant Irritability
1.15.5. Headache
1.15.6. Abnormal Head circumference
1.15.7. Sensory abnormalities
1.15.8. Abnormal gait
1.15.9. Ataxia
1.15.10. Facial weakness
1.15.11. Involuntary movements

1.16. **Ophthalmological Symptoms**

1.16.1. Red eye
1.16.2. Watering of eye
1.16.3. Discharge from eye
1.16.4. Poor vision
1.16.5. White reflex
1.16.6. Deviation of eyes

1.17. **Otorhino-laryngology Symptoms**

1.17.1. Nasal discharge, Nasal congestion, Sneezing
1.17.2. Sore Throat
1.17.3. Ear Pain/discharge
1.17.4. Tonsillar hypertrophy
1.17.5. Epistaxis
1.17.6. Impaired hearing

1.18. **Renal and Urological Symptoms**

1.18.1. Enuresis
1.18.2. Dysuria
1.18.3. Proteinuria
1.18.4. Hematuria
1.18.5. Edema
1.18.6. Hypertension
1.18.7. Dyselectrolytemia
1.18.8. Polyuria
1.18.9. Scrotal and Inguinal swelling
1.18.10. Oliguria/Anuria

1.19. **Respiratory Symptoms**

1.19.1. Cough
1.19.2. Breathlessness
1.19.3. Noisy breathing - snoring, stridor, wheeze
1.19.4. Hemoptysis

1.20. Community Situations

1.20.1. Vaccination camps
1.20.2. School Health Checkups
1.20.3. Outbreaks of childhood diseases

1.21 Analysis, interpretation, and application of Investigations

1.21.1. Radiology X-rays (Chest AP/PA/Lateral, abdomen, spine, extremities)
1.21.2. Contrast X-rays (Micturating cystourethrogram)
1.21.3. Ultrasound (Lung: Consolidation, Left Heart failure, effusion; Circulation: Intravascular Volume; Neonatal Brain: Hydrocephalus, Intracranial Collections; Central veins: Patency for US guided central lines; Lymphadenopathy: For US guided FNAC aspirations)
1.21.4. CT scan with/without contrast (Brain: Cerebral edema, Midline shift, Meningitis, Encephalitis, ADEM, Hemorrhage, Infarction, SOLS, Hydrocephalus)
1.21.5. MRI scan (Brain: Gross White vs Grey matter degeneration)
1.21.6. HIDA Scan

1.22. Microbiology

1.22.1. Grams stain of CSF, Pus, Peritoneal fluid
1.22.2. Ziehl Neilson Stain of Sputum, Pus
1.22.3. Hanging drop for motile cholera
1.22.4. PCR reports for infectious disease diagnosis
1.22.5. Culture and sensitivity reports of body fluids

1.23. Pathology

1.23.1. Pathology reports of human tissue

1.24. Routine labs

1.24.1. Hematology reports of Blood counts, peripheral smear, Bleeding and Coagulation parameters, basic immunology
1.24.2. Urine routine analysis

1.25. Biochemical

1.25.1. Biochemical routine (Electrolytes, Calcium-Phosphate, Renal, Liver profiles, Arterial/venous Blood Gases)
1.25.2. Inborn error of metabolism newborn screening reports
1.25.3. Endocrine (Glucose related, Thyroid related, Hormonal assays, Lipid profiles)

1.26. Electrophysiological Studies

1.26.1. Electrocardiogram

1.27. Lung Function Tests
1.27.1. Spirometry

C. Specific Topics

Understanding the definition, epidemiology, etiopathogenesis, clinical presentation, investigations, complications, differential diagnosis, treatment, prognosis, prevention, follow up and rehabilitation, if required, of the following, but not limited to:

1. Overview

1.1. History of Paediatrics
1.2. State of Health of Children – Global, Regional and India
1.3. Evidence-based Care in Pediatrics
1.4. WHO's Sustainable Development Goals
1.5. National Programs relevant to Child Health
1.6. Ethics in the Care of Children
1.7. Medico-legal aspects relevant to Paediatrics including: Documentation (Initial History/Examination/Differential Sheet, Progress (SOAP, Problem Oriented), Death and other Certification, Informed Consent, Wound Certificates, POSCO, Financial Receipts, Outpatient/In Patient Registers)

2. Genetics

2.1. Inheritance Patterns
2.2. Genetic Counseling
2.3. Prevention of Genetic Disorders
Management of Genetic Disorders

3. Metabolic Disorders

3.1. Approach to Inborn Errors of Metabolism
3.2. Approach to Hypoglycemia
3.3. Defects of Amino Acid Metabolism

3.3.1. Phenylalanine
3.3.2. Urea Cycle Disorders

3.4. Defects of Lipid Metabolism

3.4.1. Organic Acidemias
3.4.2. Fatty Acid Oxidation
3.4.3. Mitochondrial Disorders
3.4.4. Peroxisomal Disorders
3.4.5. Lysosomal Storage Disorders
3.4.6. Gaucher Disease
3.4.7. Niemann-Pick Disease

3.5. Defects of Carbohydrate Metabolism

3.5.1. Glycogen Storage Disease

3.6. GM1 and GM2 Gangliosidosis
3.7. Mucopolysaccharidoses
3.8. Porphyrias
3.9. Newborn Screening

4. Immunology

4.1. Laboratory Diagnosis of Immune-mediated Diseases
4.2. Primary Immunodeficiency Disorders

4.2.1. Antibodies
4.2.2. Cellular
4.2.3. Multiple types

4.2.3.1. SCID (Severe combined immunodeficiency)

4.3. Phagocytic system

4.3.1. Neutrophils
4.3.2. Leukopenia
4.3.3. Leuocyctosis

4.4. Complement pathway

4.4.1. Complement deficiencies

4.5. Intravenous Immunoglobulin
4.6. Multisystem Inflammatory Syndrome of Childhood

5. Allergy

5.1. Basis of Allergy
5.2. Allergic rhinitis
5.3. Atopic dermatitis
5.4. Urticaria, Angioedema
5.5. Anaphylaxis
5.6. Asthma
5.7. Serum sickness
5.8. Drug allergies
5.9. Food allergies

6. Fluid and Electrolytes

6.1. Body Fluids – Composition, Osmolality

6.2. Fluid Therapy - Maintenance, Replacement
6.3. Sodium
6.4. Potassium
6.5. Calcium
6.6. Magnesium
6.7. Phosphorus
6.8. Acid-base Abnormalities

7. Therapeutics

7.1. Principles of Drug Therapy
7.2. Administration of Medications
7.3. Pre-anesthesia Checkup
7.4. Procedural sedation
7.5. Analgesia

8. Acutely Ill

8.1. Assessment and Triage
8.2. Cardiopulmonary Resuscitation

8.2.1. Basic Life Support
8.2.2. Pediatric Advanced Life Support

8.3. Minor Injuries – Abrasions, Lacerations

9. Pediatric Intensive Care

9.1. Shock
9.2. Respiratory Failure
9.3. Pediatric Acute Respiratory Distress Syndrome
9.4. Ventilation – Non-Invasive and Invasive
9.5. Sedation, Analgesia and Paralysis
9.6. Nutrition in Intensive Care
9.7. ECMO
9.8. Concepts of Futility, Do not Resuscitate, Withdrawal of Care
9.9. Palliative Care
9.10. Death

10. Toxins

10.1. Clinical Approach to a Poisoned Child
10.2. Poisonings by Common Drugs
10.3. Hydrocarbon Poisoning
10.4. Poisoning in the Household
10.5. Corrosive Poisoning
10.6. Snakebite
10.7. Insect Stings including Bee, Wasp, Scorpion Sting

11. Injuries

11.1. Poly Trauma: Stabilization, Triage, and Transport
11.2. Drowning/Submersion Injuries
11.3. Animal-related Injuries

11.4. Burn Injuries
11.5. Cold Injuries

12. Neonatology

12.1. Neonatal Mortality and Morbidities
12.2. Fetal Physiology and Growth
12.3. Maternal Influences on Fetus
12.4. Transition of the Fetus to Newborn
12.5. Intrauterine diagnosis and management of Fetal disease
12.6. Organization of Neonatal Care

13. Normal Newborn

13.1. Delivery Room Care of the Newborn
13.2. Newborn Resuscitation
13.3. Assessment of the Newborn
13.4. Care of the Normal Newborn
13.5. Maintenance of Temperature
13.6. Breastfeeding and Lactation Management

14. Disorders of Weight and Gestation in Neonates

14.1. Low Birthweight

14.1.1. Feeding of Low-birth weight
14.1.2. Intrauterine Growth Restriction

14.2. Prematurity
14.3. Post term
14.4. Large for Gestational Age

15. High-risk Newborn

15.1. Recognition of High-risk neonate
15.2. Multiple-gestational pregnancies
15.3. Birth Injuries
15.4. Perinatal Asphyxia
15.5. Jaundice in the newborn
15.6. Infant of Diabetic Mother
15.7. Neonatal Hypoglycemia
15.8. Anemia and Polycythemia
15.9. The Bleeding Neonate
15.10. Hemorrhagic Disease of the
15.11. Thrombocytopenia in the Newborn
15.12. Cyanosis in the Newborn
15.13. Necrotizing Enterocolitis
15.14. Retinopathy of Prematurity
15.15. Dyselectrolytemia, Hypocalcemia, Hypermagnesemia
15.16. Neonatal Transport
15.17. Follow-up of the High-risk Neonate

16. Neonatal Infections

16.1. Neonatal Sepsis – Early and Late
16.2. Superficial Infections in Neonates
16.3. Neonatal Meningitis
16.4. Deep-seated Infections in Neonates
16.5. Neonatal Tetanus
16.6. Intrauterine Infections

17. Neonatal Neurological Problems

17.1. Seizures in the Neonates
17.2. Hypoxic Ischemic Encephalopathy
17.3. Intra-cranial/ventricular Hemorrhage
17.4. Peripheral nerve injuries

18. Neonatal Respiratory Problems

18.1. Approach to a Neonate with Respiratory Distress
18.2. Neonatal Apnea Neonatal Ventilation
18.3. Hyaline Membrane Disease
18.4. Transient Tachypnea of the Newborn
18.5. Meconium Aspiration Syndrome
18.6. Pulmonary Air Leaks in the Newborn
18.7. Persistent Pulmonary Hypertension (PPHN)
18.8. Pulmonary Hemorrhage
18.9. Bronchopulmonary Dysplasia
18.10. Extra pulmonary air leaks

19. Neonatal Cardiac Problems

19.1. Neonate with a murmur
19.2. Patent ductusarteriosus
19.3. Ductus dependent shunts

20. Hematological disorders in Neonates

20.1. Anemia in Neonate
20.2. Hemolytic Disease
20.3. Polycythemia
20.4. Hemorrhagic Disease

21. Congenital Malformations

21.1. Esophageal Atresia and Tracheoesophageal Fistula
21.2. Diaphragmatic Hernia and Eventration
21.3. Gastrointestinal and Abdominal Malformation
21.4. Genitourinary Malformations
21.5. CNS Malformations
21.6. Single Umbilical Artery, Polydactyly, Skin Tags

22. Growth: Normal and Abnormal

22.1. Normal Growth
22.2. Factors Affecting Growth

22.3. Assessment of Physical Growth
22.4. Disorders of Growth (Failure to Thrive, Overweight and Obesity)
22.5. Abnormalities of Stature

23. Development and Developmental Delay

23.1. Theories of Development and Behaviour
23.2. Laws of Development
23.3. Factors Affecting Development
23.4. Normal Development
23.5. Screening of Development and Behaviour
23.6. Approach to Diagnosis of Developmental Delay: Developmental Screening and Surveillance
23.7. Global Developmental Delay
23.8. Specific Developmental Delays
23.9. Cerebral Palsy
23.10. Intellectual Disability
23.11. Learning disabilities
23.12. Hearing Impairment
23.13. Mental Retardation

24. Behavior and Learning

24.1. Evaluation of Mental Well-Being
24.2. Psychosocial assessments
24.3. Technology Dependence
24.4. Bulling
24.5. Common Behavioral Problems
24.6. Tantrums and Breath-Holding
24.7. Enuresis and Encopresis
24.8. Sleep Medicine
24.9. Common Speech, Language, and Communication Disorders
24.10. Learning Disorders
24.11. Dyslexia
24.12. Attention-Deficit Hyperactivity Disorder
24.13. Oppositional Defiant and Conduct Disorders
24.14. Autism Spectrum Disorder
24.15. Rett Syndrome
24.16. Anorexia Nervosa and Bulimia
24.17. Anxiety Disorders
24.18. Suicide
24.19. Management of Psychological Illness

25. Nutrition and Nutritional Disorders

25.1. Nutritional Requirements
25.2. Nutritive Values of Indian Foods
25.3. Infant and Young Child Feeding
25.4. Adolescent Feeding
25.5. Feeding during Childhood and Food Allergy
25.6. Undernutrition: Prevalence and Etiology

25.7. Pathophysiology of Undernutrition
25.8. Malnutrition – Moderate and Severe Acute
25.9. Vitamin A
25.10. Vitamin B Complex
25.11. Vitamin C and Scurvy
25.12. Vitamin D, Nutritional Rickets, and Hypervitaminosis D
25.13. Iodine Deficiency Disorders
25.14. Zinc in Child Health
25.15. Trace Elements in Nutrition and Health
25.16. Fluorosis
25.17. Nutritional Rehabilitation including Diet Prescription
25.18. Enteral and Parenteral Nutrition
25.19. National Nutrition Programs

26. Immunization

26.1. Basic Concepts of Vaccination
26.2. Vaccine Administration Practices
26.3. Scheduling of Vaccines
26.4. Vaccine Storage and Cold Chain
26.5. Adverse Events following Immunization
26.6. BCG Vaccine
26.7. Poliovirus Vaccines
26.8. Diphtheria, Tetanus, and Pertussis Vaccines
26.9. Hepatitis B Vaccine
26.10. HaemophilusInfluenzae Type B (HIB) Vaccines
26.11. Measles Vaccine
26.12. Rubella Vaccines
26.13. Mumps Vaccine
26.14. Typhoid Fever Vaccines
26.15. Japanese Encephalitis Vaccine
26.16. Rabies Vaccines
26.17. Pneumococcal Vaccines
26.18. Rotavirus Vaccines
26.19. Cholera Vaccines
26.20. Varicella Vaccine
26.21. Hepatitis A Vaccine
26.22. Meningococcal Vaccine
26.23. Seasonal and Pandemic Influenza Vaccines
26.24. Human Papillomavirus Vaccines
26.25. Dengue Vaccines
26.26. Yellow Fever Vaccine
26.27. Combination Vaccines
26.28. Covid-19 Vaccines
26.29. Immunization in Special Situations

27. Adolescence

27.1. Gender, Sexual Identity and Sexuality
27.2. Psychosocial Development

28. Health Issues in Adolescence

- 28.1. Factors Influencing Adolescent Health
- 28.2. Adolescent Nutrition
- 28.3. Mental Health
- 28.4. Injuries, Violence, and Suicide
- 28.5. Menstrual Disorders
- 28.6. Polycystic Ovary Syndrome
- 28.7. Teenage Pregnancy
- 28.8. Sexually Transmitted Infections
- 28.9. Substance Abuse
  - 28.9.1. Alcohol
  - 28.9.2. Tobacco
  - 28.9.3. Other substances

29. Care of the Adolescents

- 29.1. Adolescent Counseling
- 29.2. Promoting Health of Adolescents
- 29.3. Adolescent Friendly Health Services

30. Infectious Diseases

- 30.1. Epidemiology of Infectious Diseases
- 30.2. Laboratory Diagnosis of Infection
- 30.3. Microbiome and Child Health
- 30.4. Antimicrobial Resistance
- 30.5. Infection Control and Prevention

31. Fever

- 31.1. Fever: General Principles of Management
- 31.2. Fever with/without focus
- 31.3. Fever of Unknown Origin
- 31.4. Infections in Immunocompromised conditions

32. Bacterial Infections

- 32.1. Natural History of Bacterial Infection
- 32.2. Principles of Antibiotic Therapy
- 32.3. Gram Positive Infections
  - 32.3.1. Streptococcal Infections
    - 32.3.1.1. Pneumococcal Infections
    - 32.3.1.2. Streptococcal Group A
    - 32.3.1.3. Streptococcal Group B
    - 32.3.1.4. Streptococcal Non A, Non B
  - 32.3.2. Staphylococcal Infections
  - 32.3.3. Enterococcus
  - 32.3.4. Diphtheria
  - 32.3.5. Nocardiosis
  - 32.3.6. Listeria monocytogenes
  - 32.3.7. Actinomycosis

32.4. Gram Negative Infections

32.4.1. Haemophilusinfluenzae
32.4.2. Neisseria
32.4.3. Pseudomonas
32.4.4. Pertussis
32.4.5. Salmonella

32.4.5.1. Nontyphoidal Salmonellosis
32.4.5.2. Enteric Fever

32.4.6. Shigella
32.4.7. Escherichia coli
32.4.8. Cholera
32.4.9. Campylobacter
32.4.10. Yersina
32.4.11. Aeromonas
32.4.12. Brucella
32.4.13. Moraxella catarrhalis
32.4.14. Helicobacter pylori

32.5. Anaerobic Bacterial

32.5.1. Clostridium tetani
32.5.2. Clostridium botulinum
32.5.3. Clostridium difficile

32.6. Spirochetal Infections

32.6.1. Treponemapallidum
32.6.2. Leptospirosis
32.6.3. Borrelia

32.6.3.1. Lyme
32.6.3.2. Relapsing Fever

32.7. Mycoplasma

32.7.1. Mycoplasma pneumoniae

32.8. Chlamydia

32.8.1. Chlamydia pneumonia
32.8.2. Chlamydia trachomatis
32.8.3. Psittacosis

32.9. Rickettsia

32.9.1. Spotted Fever
32.9.2. Scrub Typhus
32.9.3. Typhus
32.9.4. Ehrlichiosis
32.9.5. Q fever

33. Mycobacterial Infections

33.1. Childhood Tuberculosis: Epidemiology, Pathogenesis, Clinical Features, and Prevention

33.2. Diagnostic Tools for Tuberculosis in Children
33.3. Antitubercular Drugs and RNTCP
33.4. Guidelines for Childhood Tuberculosis
33.5. Drug Resistant Tuberculosis
33.6. Atypical Mycobacterial Infections
33.7. Leprosy

34. Viral Diseases

34.1. Epidemiology of Viral Infections
34.2. Principles of Antiviral Drugs
34.3. Measles
34.4. Mumps
34.5. Rubella
34.6. Roseola
34.7. Epstein-Barr
34.8. Cytomegalovirus
34.9. Influenza
34.10. Parainfluenza
34.11. Respiratory syncytial virus
34.12. Human metapneumovirus
34.13. Rhinovirus
34.14. Adenovirus
34.15. Coronavirus
34.16. Rotavirus
34.17. Human Papillomavirus
34.18. Arbovirus

34.18.1. Japanese Encephalitis
34.18.2. Other Encephalitis
34.18.3. Tick-borne Encephalitis
34.18.4. Chikungunya
34.18.5. Zika

34.19. Varicella-zoster
34.20. Herpes Simplex
34.21. Rabies
34.22. Parvovirus Infections
34.23. NonpolioEnteroviral Infections
34.24. Poliomyelitis
34.25. Viral Hepatitis
34.26. HIV
34.27. Human Lymphotrophic 1 and 2
34.28. Dengue
34.29. Yellow Fever
34.30. Ebola, Hanta
34.31. Rabies
34.32. Viral Hemorrhagic Fevers
34.33. Covid-19

35. Protozoal Disease

35.1. Epidemiology of Parasitic Infections
35.2. Principles of Antiparasitic therapy
35.3. Malaria
35.4. Leishmaniasis
35.5. Giardiasis
35.6. Amebiasis
35.7. Filariasis
35.8. Cryptosporidiosis
35.9. Toxoplasmosis
35.10. Helminthiasis

35.10.1. Hookworm Infestation
35.10.2. Ascariasis
35.10.3. Trichuriasis
35.10.4. Enterobiasis
35.10.5. Strongyloidiasis
35.10.6. Tapeworm Diseases
35.10.7. Cysticercosis
35.10.8. Trichinosis
35.10.9. Toxocara
35.10.10. Intestinal, Liver, and Lung Flukes
35.10.11. Hydatid Disease: Echinococcosis
35.10.12. Schistosomiasis

36. Fungal Infections

36.1. Fungi
36.2. Principles of Antifungal Therapy
36.3. Candidiasis
36.4. Aspergillosis
36.5. Malassezia
36.6. Cryptococcosis
36.7. Coccidioidomycosis
36.8. Blastomycosis
36.9. Histoplasmosis
36.10. Mucormycosis
36.11. Pneumocystis Jirovecii

37. Diarrheal Illnesses

37.1. Acute Watery Diarrhea
37.2. Dysentery
37.3. Cholera
37.4. Persistent Diarrhea
37.5. Chronic Diar*rhea*
37.6. Antibiotic Associated Diarrhea

38. Gastrointestinal Disorders

38.1. Anatomy and Physiology
38.2. Common Symptoms of Gastrointestinal Diseases
38.3. Oral Cavity disorders

38.3.1. Malocclusion
38.3.2. Dental Caries
38.3.3. Periodontal disease
38.3.4. Common lesions of soft palate
38.3.5. Cleft Lip and Cleft Palate
38.3.6. Diseases of Salivary Glands

38.4. Esophageal atresia, Tracheoesophageal Fistula
38.5. Disorders of Esophageal Motility
38.6. Gastroesophageal Reflux
38.7. Esophagitis
38.8. Hiatal Hernia
38.9. Ingestions

38.9.1. Foreign Body
38.9.2. Caustic

38.10. Infantile Hypertrophic Pyloric Stenosis, Volvulus, Duplication
38.11. Duodenal Obstruction
38.12. Malrotation
38.13. Intestinal duplication
38.14. Meckel Diverticulum
38.15. Chronic obstructive pseudoobstruction
38.16. Chronic Abdominal Pain—Functional Abdominal Pain
38.17. Acid Peptic Disease
38.18. Pancreas – Function, Tests

38.18.1. Pancreatitis
38.18.2. Treatment of Pancreatic insufficiency

38.19. Constipation
38.20. Hirschsprung Disease
38.21. Malabsorption Disorders

38.21.1. Assessment
38.21.2. Celiac
38.21.3. Enzyme Deficiencies

38.22. Inflammatory Bowel Disease
38.23. Intestinal Obstruction
38.24. Intussusception
38.25. Appendicitis
38.26. Abdominal Tuberculosis
38.27. Ascites
38.28. Umbilical Hernia
38.29. Inguinal Hernia
38.30. Testicular Torsion
38.31. Anorectal Disorders

38.31.1. Anal Fissure
38.31.2. Hemorrhoids
38.31.3. Prolapse

38.31.4. Pilonidal sinus
38.31.5. Anorectal malformations

38.32. Cyclic vomiting

39. Hepatobiliary Diseases

39.1. Liver Function Tests
39.2. Neonatal Cholestasis
39.3. Portal Hypertension
39.4. Gastrointestinal Bleeding
39.5. Metabolic Liver disease

39.5.1. Wilson
39.5.2. Others

39.6. Liver Abscess
39.7. Viral Hepatitis
39.8. Chronic Liver Disease
39.9. Acute Liver Failure
39.10. Autoimmune Hepatitis
39.11. Drug induced Hepatitis
39.12. Cystic disease of Liver
39.13. Liver transplantation
39.14. Liver Tumors
39.15. Peritoneum

39.15.1. Ascites
39.15.2. Peritonitis

39.16. Epigastric hernia

40. Disorders of Hematopoietic System

40.1. The Hematopoietic System
40.2. Anemia: Etiology and Classification
40.3. Inadequate Production

40.3.1. Physiological anemia of infancy
40.3.2. Congenital Bone Marrow Failure
40.3.3. Aplastic Anemia
40.3.4. Iron Deficiency Anemia
40.3.5. Megaloblastic Anemia
40.3.6. Anemia of Chronic disease
40.3.7. Congenital dyserthropoietic anemia

40.4. Hemolytic Anemia

40.4.1. Hemoglobinopathies

40.4.1.1. Sickle Cell Disease
40.4.1.2. Thalassemia

40.4.2. RBC Membrane Defects
40.4.3. Red Blood Cell Enzyme Defects
40.4.4. Immune Hemolytic Anemia

40.5. Polycythemia

40.6. Hemorrhagic and Thrombotic disorders

40.6.1. Coagulation Disorders
40.6.2. Hemophilia
40.6.3. Other Clotting Factor Deficiencies
40.6.4. Von Willebrand Disease
40.6.5. Thrombotic disorders
40.6.6. Disseminated Intravascular Coagulation

40.7. Platelet

40.7.1. Immune Thrombocytopenia
40.7.2. Hemolytic Uremic Syndrome
40.7.3. Thrombotic Thrombocytopenic Purpura
40.7.4. Kasabach- Merritt Syndrome
40.7.5. Platelet Function Defects

40.8. Blood Component Therapy

40.9. Spleen

40.9.1. Splenomegaly
40.9.2. Splenectomy

40.10. Lymphatics

40.10.1. Lymphadenopathy

41. Respiratory Diseases

41.1. Congenital Malformations of the Upper Respiratory Tract
41.2. Epistaxis
41.3. Nasal Polyps
41.4. Allergic Rhinitis
41.5. Otitis Media
41.6. Common Cold
41.7. Acute Pharyngitis
41.8. Retropharyngeal abscess
41.9. Sinusitis
41.10. Tonsils and Adenoids
41.11. Community Acquired Pneumonia
41.12. Pleural effusion, Empyema
41.13. Bronchiectasis
41.14. Pneumothorax, Pneumomediastinum, Pyopneumothorax
41.15. Skeletal deformities of Chest
41.16. Obstructive Sleep Apnea
41.17. Congenital Malformations of the Respiratory Tract
41.18. Congenital disorders of Lung
41.19. Croup, Epiglottitis, Laryngitis, Tracheitis
41.20. Bronchiolitis
41.21. Alpha-1 Antitrypsin Deficiency

41.22. Aspiration Syndromes
41.23. Preschool Wheeze and Bronchial Asthma
41.24. Aerosol Therapy
41.25. Pneumonia
41.26. Parapneumonic Effusion and Empyema
41.27. Pneumothorax and Air Leaks
41.28. Persistent and Recurrent Pneumonia
41.29. Interstitial Lung Disease
41.30. Hemoptysis and Alveolar Bleeds
41.31. Primary Ciliary Dyskinesia
41.32. Cystic Fibrosis
41.33. Bronchiectasis
41.34. Lung Abscess
41.35. Foreign Body Aspiration
41.36. Central Hypoventilation
41.37. Acute Respiratory Distress Syndrome
41.38. SIDS

42. Cardiovascular Disorders

42.1. Genetic Basis of Heart Diseases
42.2. Chest Skiagram in Heart Disease
42.3. Electrocardiogram
42.4. Echocardiography
42.5. Congestive Heart Failure
42.6. Cardiac Malposition
42.7. Acyanotic Congenital Heart Disease, Left to Right shunt

42.7.1. Ventricular Septal Defects
42.7.2. Patent DuctusArteriosus
42.7.3. Atrial Septal Defects
42.7.4. PAPVC
42.7.5. Atrioventricular Septal Defects

42.8. Acyanotic Congenital Heart Disease, Obstructive

42.8.1. Pulmonary Valve Stenosis
42.8.2. Coarctation of Aorta
42.8.3. Pulmonary Venous Hypertension

42.9. Acyanotic Congenital Heart Disease, Regurgitation

42.9.1. Mitral Valve Prolapse

42.10. Cyanotic Congenital Heart Disease, reduced Pulmonary flow

42.10.1. Tetralogy of Fallot and Variants
42.10.2. Tricuspid Atresia
42.10.3. Double outlet Right Ventricle
42.10.4. Ebstein Anomaly

42.11. Cyanotic Congenital Heart Disease, Increased Pulmonary flow

42.11.1. Transposition of Great Arteries and variants
42.11.2. TruncusArteriosus
42.11.3. TAPVC
42.11.4. Hypoplastic Left Heart Syndrome

42.12. Others

42.12.1. Anomalies of the Aortic Arch
42.12.2. Pulmonary Arterial Hypertension

42.13. Acquired Heart Disease

42.13.1. Acute Rheumatic Fever
42.13.2. Rheumatic Heart Disease
42.13.3. Infective Endocarditis
42.13.4. Myocardial Diseases: Myocarditis and Cardiomyopathies
42.13.5. Diseases of the Pericardium
42.13.6. Kawasaki disease

42.14. Cardiac Arrhythmias
42.15. Cardiac Emergencies
42.16. Heart Failure
42.17. Systemic Hypertension

43. Disorders of the Kidney and Urinary Tract

43.1. Investigations for Kidneys and Urinary Tract
43.2. Congenital Anomalies of Kidneys and Urinary Tract

43.2.1. Cystic Kidney Diseases

43.3. Glomerular Disease

43.3.1. Glomerulonephritis

43.3.1.1. Acute Poststreptococcal Glomerulonephritis
43.3.1.2. Membranous Nephropathy
43.3.1.3. Membranoproliferative Glomerulonephritis
43.3.1.4. RapidlyProgressive Glomerulonephritis

43.3.2. IgA nephropathy
43.3.3. Alport syndrome

43.4. Systemic Vasculitis and Lupus Nephritis
43.5. Goodpasture Disease
43.6. Henoch-SchonleinPurpura Nephritis
43.7. Hemolytic Uremic Syndrome
43.8. Toxic Nephropathy
43.9. Tubulointerstitial Disease

43.9.1. Pyelonephritis
43.9.2. Tubulointerstitial nephritis
43.9.3. Papillary necrosis
43.9.4. Acute Tubular Necrosis

43.10. Vascular Disease

43.10.1. Renal vein Thrombosis
43.10.2. Hypercalciuria
43.10.3. Nephrocalcinosis

43.11. Infections

43.11.1. Urinary Tract Infection
43.11.2. Cystitis
43.11.3. Urethritis
43.11.4. Hemorrhagic cystitis
43.11.5. Pyelonephritis

43.12. Proteinuria

43.12.1. Transient, Orthostatic
43.12.2. Nephrotic Syndrome

43.13. Tubular Disorders

43.13.1. Renal Tubular Disorders
43.13.2. Nephrogenic Diabetes Insipidus
43.13.3. Bartter Syndrome
43.13.4. Gitelman Syndrome

43.14. Renal Failure

43.14.1. Acute Kidney Injury
43.14.2. Chronic Kidney disease
43.14.3. End-stage renal disease
43.14.4. Renal Replacement Therapy
43.14.5. Renal Transplantation

43.15. Renal Calculi
43.16. Refractory Rickets
43.17. Hypertension
43.18. Vesicoureteral Reflux
43.19. Voiding Disorders
43.20. Penile anomalies

44. Gynecological Issues

44.1. Vaginal bleeding in prepubertal children
44.2. Breast concerns
44.3. Female genital mutilation

45. Neurological Disorders

45.1. Approach to Neurological Disorders including localization
45.2. Cerebrospinal Fluid and Neurophysiology
45.3. Neuroimaging
45.4. Congenital Anomalies

45.4.1. Neural Tube Defects and Spinal Cord Malformations

45.4.2. Microcephaly
45.4.3. Brain Malformations
45.4.4. Hydrocephalus
45.4.5. Craniosynostosis

45.5. Seizures

45.5.1. Febrile Seizures
45.5.2. Unprovoked Seizures and Epilepsy

45.5.2.1. Generalized
45.5.2.2. Focal
45.5.2.3. Reflex Seizures

45.5.3. Treatment of Seizures
45.5.4. Status Epilepticus
45.5.5. Nonepileptic Paroxysmal Disorders

45.6. Headaches

45.6.1. Migraine
45.6.2. Tension Headache
45.6.3. Secondary Headaches

45.7. Neurocutaneous Syndromes
45.8. Movement Disorders
45.9. Encephalopathies

45.9.1. Cerebral Palsy
45.9.2. Autoimmune
45.9.3. Mitochondrial

45.10. Neurodegenerative Disorders

45.10.1. Grey versus White Matter
45.10.2. Sphingolipidosis
45.10.3. Neuronal CeroidLipofuscinoses
45.10.4. Adrenoleucodystrophy

45.11. Demyelinating Disorders

45.11.1. Acute Disseminated Encephalomyelitis
45.11.2. Optic Neuritis
45.11.3. Transverse Myelitis
45.11.4. Multiple Sclerosis
45.11.5. Autoimmune and Paraneoplastic

45.12. Stroke

45.12.1. Arterial versus Venous

45.13. CNS Vasculitis
45.14. CNS Infections

45.14.1. Acute Pyogenic Meningitis
45.14.2. Tuberculosis of the Central Nervous System

45.14.3. Viral Meningoencephalitis
45.14.4. Neurocysticercosis
45.14.5. Brain Abscess

45.15. PseudotumorCerebri
45.16. Coma and Raised Intracranial Pressure
45.17. Brain Death
45.18. Infantile Tremor Syndrome
45.19. Neurometabolic Disorders
45.20. Spinal Cord Disorders
45.21. Traumatic Brain Injury
45.22. Neuro-Rehabilitation

45.22.1. Traumatic Brain Injury
45.22.2. Spinal cord Injury
45.22.3. Spasticity
45.22.4. Brachial plexus injury
45.22.5. Meningomyelocele
45.22.6. Disabled Child

46. Neuromuscular Disorders

46.1. Approach to Diagnosis of Neuromuscular Disorders
46.2. Floppy Infant
46.3. Congenital Muscle Disorders

46.3.1. Congenital Myopathies
46.3.2. Arthrogryposis

46.4. Muscular Dystrophies

46.4.1. Duchenne and Becker Muscular Dystrophy
46.4.2. Myotonic Muscular Dystrophy
46.4.3. Limb Girdle Muscular Dystrophy
46.4.4. Fascio-scapulo-humeral Muscular Dystrophy

46.5. Endocrine/Toxic Myopathies
46.6. Metabolic Myopathies

46.6.1. Periodic Paralysis
46.6.2. Glucogenoses
46.6.3. Mitochondrial
46.6.4. Lipid

46.7. Neuromuscular Transmission Disorders

46.7.1. Myasthenia Gravis
46.7.2. Spinal Muscular Atrophy
46.7.3. Motor Neuron Disease

46.8. Hereditary Motor Sensory Neuropathies

46.8.1. Peroneal Muscular Atrophy
46.8.2. Refsum Disease
46.8.3. Fabry Disease
46.8.4. Leukodystrophy

46.8.5. Acute Flaccid Paralysis

46.9. Toxic Neuropathies
46.10. Autonomic Neuropathy
46.11. Guillain-Barré Syndrome
46.12. Bell Palsy

47. Disorders of the Endocrine System

47.1. Physiology of Neuroendocrinology
47.2. Hypopituitarism

47.2.1. Growth Hormone Deficiency and Resistance
47.2.2. Polyuria, Diabetes Insipidus and Syndrome of Inappropriate Secretion of ADH

47.3. Thyroid Disorders

47.3.1. Thyroid Hormone Physiology
47.3.2. Hypothyroidism
47.3.3. Thyroiditis
47.3.4. Hyperthyroidism
47.3.5. Goiter and Thyroid Nodules
47.3.6. Newborn Screening for Congenital Hypothyroidism

47.4. Parathyroid Disorders

47.4.1. Bone Mineral and Hormone Physiology
47.4.2. Calcium Disorders
47.4.3. Metabolic Rickets
47.4.4. Disorders with Bone Fragility
47.4.5. Hypoparathyroidism
47.4.6. Pseudo hypothyroidism
47.4.7. Hyperparathyroidism

47.5. Pubertal Development

47.5.1. Normal Puberty
47.5.2. Delayed Puberty
47.5.3. Precocious Puberty

47.6. Adrenal Gland Disorders

47.6.1. Normal Development and Physiology of the Adrenal Gland
47.6.2. Congenital Adrenal Hyperplasia
47.6.3. Adrenal Insufficiency
47.6.4. Cushing Syndrome
47.6.5. Primary Aldosteronism
47.6.6. Pheochromocytoma

47.7. Gonad Disorders

47.7.1. Testicular Hypofunction
47.7.2. Ovarian Hypofunction
47.7.3. Gynecomastia
47.7.4. Disorders of Sex Development

47.7.5. Cryptorchidism and Micropenis

47.8. Glucocorticoid Use and Withdrawal

47.9. Diabetes Mellitus

47.9.1. Classification of Diabetes Mellitus
47.9.2. Type 1 Diabetes Mellitus
47.9.3. Type 2 Diabetes Mellitus
47.9.4. Acute and Chronic Complications of Diabetes Mellitus

47.10. Monogenic Obesity
47.11. Hyperlipidemia
47.12. Endocrine Consequences of Thalassemia Major
47.13. Endocrine Effects of Radiation and Cancer Chemotherapy
47.14. Adult Consequences of IUGR and Preterm Birth

48. Malignancies in Children

48.1. Epidemiology and Biology of Cancers
48.2. Principles of Diagnosis and Therapy of Cancer
48.3. Leukemias

48.3.1. Acute Lymphoblastic Leukemia
48.3.2. Acute Myelogenous Leukemia
48.3.3. Chronic Myelogenous Leukemia
48.3.4. Infantile Leukemia

48.4. Lymphoma

48.4.1. Hodgkin Lymphoma
48.4.2. Non-Hodgkin Lymphoma

48.5. Brain Tumors
48.6. Neuroblastoma
48.7. Wilms Tumor
48.8. Soft Tissue Tumors
48.9. Bone Tumors
48.10. Retinoblastoma
48.11. Gonadal, Germ cell neoplasms
48.12. Hemangioma
48.13. Lymphangiomas, Cystic Hygromas
48.14. Thyroid Tumours
48.15. Nasopharyngeal Carcinoma
48.16. Adrenal Tumours
48.17. Histiocytosis

48.17.1. LCH
48.17.2. HemophagocyticLymphohistiocytosis

48.18. Oncological Emergencies and Supportive Care
48.19. Hematopoietic Stem Cell Transplant

49. Rheumatological Disorders

49.1. Approach to a Child with Rheumatological Disorder
49.2. Laboratory Investigations for Rheumatological Disorders
49.3. Drugs and Principles of Management for Rheumatic Disorders
49.4. Juvenile Idiopathic Arthritis
49.5. Reactive, Post-Infectious Arthritis
49.6. Systemic Lupus Erythematosus: Clinical Features and Diagnostic Criteria
49.7. Management of Systemic Lupus Erythematosus
49.8. Juvenile Dermatomyositis
49.9. Large Vessel Vasculitis: Takayasu Arteritis
49.10. Medium Vessel Vasculitis: Kawasaki Disease and PolyarteritisNodosa
49.11. Small Vessel Vasculitis:Henoch-SchönleinPurpuraand ANCA Associated Vasculitis
49.12. Juvenile Scleroderma
49.13. Antiphospholipid Syndrome
49.14. Growing Pains

50. Common Eye Abnormalities

50.1. Common Visual Problems
50.2. Congenital Anomalies
50.3. Refractive Errors
50.4. Cornea and Conjunctiva
50.5. Uveitis
50.6. Cataract and Lens
50.7. Glaucoma
50.8. Optic Nerve and Pupil
50.9. Strabismus and Motility Disorders
50.10. Eyelid, Orbit, and Lacrimal Sac
50.11. Ocular Injuries
50.12. Orbital Infections
50.13. Ocular Manifestations of Systemic Disorders

51. Common ENT Problems

51.1. Hearing Loss
51.2. Congenital malformations of Ear
51.3. External Otitis
51.4. Otitis Media
51.5. Mastoiditis
51.6. Inner Ear

52. Common Skin Problems

52.1. Skin of the Newborn: Physiological and Pathological Changes
52.2. Care of Skin in the Newborn
52.3. Infections and Infestations
52.4. Congenital Cutaneous Malformations
52.5. Vitiligo and Other Hypopigmentary Diseases
52.6. Atopic Dermatitis
52.7. Contact Dermatitis

52.8. Urticaria and Mastocytosis
52.9. Psoriasis, GianottiCrosti Syndrome
52.10. AcanthosisNigrans
52.11. Cutaneous Drug Reactions
52.12. Cutaneous Manifestations of Nutritional Deficiency
52.13. Cutaneous Manifestations of Collagen Vascular Diseases
52.14. Neurocutaneous Syndromes
52.15. Vesiculobullous Disorders
52.16. Papulosquamous Disorders
52.17. Ichthyosis
52.18. Genetic Cutaneous Disorders
52.19. Hair Disorders
52.20. Nail Disorders
52.21. Infections of Skin

52.21.1. Impetigo
52.21.2. Subcutaneous Infections
52.21.3. Staphylococcal Scalded Skin Syndrome
52.21.4. Ecthyma
52.21.5. Fungal Infections
52.21.6. Viral Infections
52.21.7. Arthropod bites
52.21.8. Scabies
52.21.9. Pediculosis
52.21.10. Acne

53. Disorders of Bones and Joints

53.1. Assessment of the Locomotor System
53.2. Deformities of Foot and Toes

53.2.1. Congenital TalipesEquinovarus

53.3. Torsional deformities of Limb
53.4. Leg Length discrepancies
53.5. Transient Monoarticularsynovitis
53.6. Legg-Calvé-Perthes Disease
53.7. Neck Problems

53.7.1. Torticollis
53.7.2. Cervical anomalies

53.8. Scoliosis and Kyphosis
53.9. Developmental Dysplasia of the Hip (DDH)
53.10. Osteomyelitis
53.11. Septic Arthritis
53.12. Osgood-Schlatter Disease
53.13. Arthrogryposis
53.14. Injuries to Bones/Joints
53.15. Skeletal Dysplasia
53.16. Osteogenesisimperfecta
53.17. Marfan Syndrome
53.18. Metabolic Bone Disease

53.18.1. Hypo/Hyperphosphatemia
53.18.2. Osteoporosis

54. Vulnerable Children

54.1. Street Children
54.2. Child Labor
54.3. Child Abuse and Neglect
54.4. Adoption: Medical and Legal Issues
54.5. Rights of the Child

55. Environmental Health

55.1. Climate Change and its impact on Health
55.2. Air Pollution and its impact on Health
55.3. Biomedical Waste Management

56. Community Pediatrics

56.1. Indicators of Child Health
56.2. Environment and Child Health
56.3. Lead Poisoning
56.4. Adoption
56.5. Travel Medicine
56.6. Protection of Children from Sexual Offences ACT 2012
56.7. Rights of People With Disability Act 2016
56.8. National Programs for Child Health as relevantto Natonal Health Mission including RBSK.
56.9. Integrated Management of Neonatal and ChildhoodIllness-Facility (IMNCI-F)
56.10. Investigation of an Outbreak

57. Quality Assessment and Improvement

57.1.1. Point of Care Quality Improvement

B. Psychomotor Domain

- *Should be able to perform independently in the practice of Paediatrics, the following diagnostic and therapeutic interventions as listed below:*

1. Physical Examination

1.1. Measurement of Vitals
1.2. Measurement of Anthropometry
1.3. General physical examination
1.4. Physical Examination of Systems
1.5. Development (Screening) Assessment
1.6. Behavioral (Screening) Assessment
1.7. Sexual Maturity Assessment
1.8. Newborn Assessment including gestational assessments
1.9. Breastfeeding Assessment of Position and Attachment
1.10. Motor Disability Assessment

1.11. Autism Spectrum Disorder Screening
1.12. Fundus examination
1.13. Middle ear examination
1.14. Throat examination
1.15. Triage - Rapid assessment of Airway, Breathing and Circulation
1.16. Hand hygiene
1.17. Biomedical Waste disposal guidelines

2. Non-Invasive Monitoring

2.1. Pulse oximetry
2.2. Electrocardiogram
2.3. Vital Data Monitor

3. Procedures – Diagnostic

3.1. Informed Consent
3.2. Aseptic measures for all invasive procedures
3.3. Sampling

3.3.1. Venous blood
3.3.2. Arterial blood
3.3.3. Capillary blood

3.4. Vascular Access and cannulation

3.4.1. Intravenous – Peripheral
3.4.2. Intravenous - Central
3.4.3. Intraosseous
3.4.4. Intraarterial
3.4.5. Umbilical Vein

3.5. Diagnostic Taps

3.5.1. Pleural
3.5.2. Peritoneal
3.5.3. CSF
3.5.4. Pericardial
3.5.5. Joint fluid

3.5.6. Subdural
3.5.7. Ventricular

3.6. Urinary Catheterization
3.7. Urine collection

3.7.1. Mid-stream sampling
3.7.2. Catheter sampling
3.7.3. Suprapubic puncture

3.8. Tuberculin Skin Test
3.9. Antibiotic Test Dose
3.10. Feeding/Ryles Tube

3.10.1. Insertion

3.10.2. Gastric Aspiration
3.10.3. Feeds
3.10.4. Stomach wash

3.11. Respiratory

3.11.1. Naso, Pharyngeal and Nasopharyngeal swab collection

3.12. Suppository insertion
3.13. Per rectal exam
3.14. Inspection of Vulva/Vagina
3.15. Aspiration/Biopsy

3.15.1. Bone marrow
3.15.2. Liver
3.15.3. Kidney
3.15.4. FNAC Lymph node

3.16. Ultrasound – Lung (B line, Effusion), Circulation (IVC Volume), Vascular access (Central venous), Soft Tissue (Pus)
3.17. Blood Group/Type
3.18. Smears

3.18.1. Malaria Parasite Smear/Rapid Antigen Test
3.18.2. Peripheral Blood Smear
3.18.3. CSF/Pus Grams Stain
3.18.4. Sputum Ziehl Neilson Smear

3.19. Urine dipstick
3.20. Stool Hanging drop
3.21. Glucometer Blood Sugar
3.22. Shake test (Newborn gastric aspirate)
3.23. Electrocardiogram
3.24. Specific Screening/Assessment Tools

3.24.1. Gestation Assessments
3.24.2. Anthropometric measurements and Growth charting
3.24.3. Peak Flow Meter Measurement
3.24.4. HEADSS screening (Adolescence)
3.24.5. DDST screening (Development Assessment)
3.24.6. Assessment of Sexual Maturity using Tanner's
3.24.7. M-CHAT-R screening (Autism Assessment)
3.24.8. GMSCF Assessment of Motor Disability (Cerebral Palsy)
3.24.9. Pain assessment

4. Procedures – Therapeutic

4.1.Informed Consent
4.2.Prescriptions/Medication Orders
4.3.Neonatal Resuscitation Programincluding intubation
4.4.Basic Life Support
4.5.Advanced Paediatric Life Support including intubation

4.6.Heimlich, Foreign Body Removal
4.7.Exchange Transfusion
4.8.Stomach wash
4.9.Injections

- 4.9.1. Intravenous
- 4.9.2. Intramuscular
- 4.9.3. Subcutaneous
- 4.9.4. Intradermal

4.10. Infusions

- 4.10.1. IV bolus
- 4.10.2. Intravenous
- 4.10.3. Intraosseous
- 4.10.4. Blood Component Transfusion

4.11. Respiratory

- 4.11.1. Meter dose inhalation with or without Spacer/Mask
- 4.11.2. Nebulization
- 4.11.3. Airway Insertion – Nasopharyngeal, Oropharyngeal
- 4.11.4. Needle Cricothyroidotomy
- 4.11.5. Oxygen delivery methods
- 4.11.6. HFNC/CPAP/Non-Invasive Ventilation
- 4.11.7. Ventilation – Conventional
- 4.11.8. Intercostal drainage
- 4.11.9. Surfactant Administration (INSURE)

4.12. Spinal infusion/injection
4.13. Therapeutic Ascitic Tap
4.14. Peritoneal dialysis
4.15. Phototherapy
4.16. Incision and Drainage
4.17. Dressings
4.18. Sling
4.19. Transport onto and off stretcher
4.20. Neonatal Temperature Warm Chain Measures

- 4.20.1. Wrapping up Newborn
- 4.20.2. Kangaroo Mother Care

4.21. Immunization Cold Chain Measures

- 4.21.1. Refrigerator
- 4.21.2. Vaccine carrier

4.22. Restraining a child
4.23. Transporting a child
4.24. Early Interventional Therapy
4.25. Chest Physiotherapy

Milestones to be achieved on Psychomotor Skills through Year 1 to 3.
O-Observe PS-Perform under supervision PI-Perform ndependently

Milestones	1st Year	2nd Year	3rd Year
1. Physical Examination			
1.1. Measurement of Vitals	PI		
1.2. Measurement of Anthropometry	PI		
1.3. General physical examination	PI		
1.4. Physical Examination of Systems	PI		
1.5. Development (Screening) Assessment	O, PS	PI	
1.6. Behavioral (Screening) Assessment	O	PS	PI
1.7. Sexual Maturity Assessment	O, PS	PI	
1.8. Newborn Assessment including gestational assessments	PI		
1.9. Breastfeeding Assessment	PI		
1.10. Motor Disability Assessment	O	PS	PI
1.11. Autism Spectrum Disorder Screening	O	PS	PI
1.12. Fundus examination	PI		
1.13. Middle ear examination	PI		
1.14. Throat examination	PI		
1.15. Triage - Rapid assessment of ABC	PI		
1.16. Hand hygiene	PI		
1.17. Biomedical Waste disposal guidelines	PI		
2. Non-Invasive Monitoring			
2.1. Pulse oximetry	PI		
2.2. Electrocardiogram	PI		
2.3. Vital Data Monitor	PI		
3. Procedures – Diagnostic			
3.1. Informed Consent	PI		
3.2. Aseptic measures for all procedures	PI		
3.3. Sampling			
3.3.1. Venous blood	PI		
3.3.2. Arterial blood	PI		

3.3.3. Capillary blood	PI		
3.4. Vascular Access and cannulation			
3.4.1. Intravenous – Peripheral	PI		
3.4.2. Intravenous - Central	O	PS	PI
3.4.3. Intraosseous	PI		
3.4.4. Intraarterial	O	PS	PI
3.4.5. Umbilical Vein	PI		
3.5. Diagnostic Taps			
3.5.1. Pleural	PS	PI	
3.5.2. Peritoneal	PI		
3.5.3. CSF	PI		
3.5.4. Pericardial	O	PS	PI
3.5.5. Joint fluid	O	PS	PI
3.5.6. Subdural	O, PS	PI	
3.5.7. Ventricular	O	PS	PI
3.6. Urinary Catheterization	PI		
3.7. Urine collection			
3.7.1. Mid-stream sampling	PI		
3.7.2. Catheter sampling	PI		
3.7.3. Suprapubic puncture	PI		
3.8. Tuberculin Skin Test	PI		
3.9. Antibiotic Test Dose	PI		
3.10. Feeding/Ryles Tube			
3.10.1. Insertion	PI		
3.10.2. Gastric Aspiration	PI		
3.10.3. Feeds	PI		
3.10.4. Stomach wash	PI		
3.11. Respiratory			
3.11.1. Naso, Pharyngeal, NP swab collection	PI		
3.12. Suppository insertion	PI		
3.13. Per rectal exam	O	PS	PI

3.14. Inspection of Vulva/Vagina	PI		
3.15. Aspiration/Biopsy			
3.15.1. Bone marrow	O, PS	PI	
3.15.2. Liver	O	PS	PI
3.15.3. Kidney	O	PS	PI
3.15.4. FNAC Lymph node	O	PS	PI
3.16. Ultrasound – Lung (B line, Effusion), Circulation (IVC Volume), Vascular access (Central venous), Soft Tissue (Pus)	O	O, PS	PS
3.17. Blood Group/Type	O, PS	PI	
3.18. Smears			
3.18.1. Malaria Parasite Smear/Rapid Antigen Test	O, PS	PI	
3.18.2. Peripheral Blood Smear	O, PS	PI	
3.18.3. CSF/Pus Grams Stain	O, PS	PI	
3.18.4. Sputum Ziehl Neilson Smear	O, PS	PI	
3.19. Urine dipstick	PI		
3.20. Stool Hanging drop	O, PS	PI	
3.21. Glucometer Blood Sugar	PI		
3.22. Shake test (Neon gastric aspirate)	PI		
3.23. Electrocardiogram	PI		
3.24. Specific Screening/Assessment Tools			
3.24.1. Gestation Assessments	PI		
3.24.2. Anthropometric measurements and Growth charting	PI		
3.24.3. Peak Flow Meter Measurement	PI		
3.24.4. HEADSS screening (Adolescence)	O, PS	PI	
3.24.5. DDST screening (Development Assessment)	O, PS	PI	
3.24.6. Assessment of Sexual Maturity using Tanner's	O, PS	PI	
3.24.7. M-CHAT-R screening (Autism Assessment)	O	PS	PI
3.24.8. GMSCF Assessment of Motor Disability (Cerebral Palsy)	O	PS	PI

3.24.9. Pain assessment	PI		
4. Procedures – Therapeutic			
4.1. Informed Consent	PI		
4.2. Prescriptions/Medication Orders	PI		
4.3. Neonatal Resuscitation Program including ET	PI (BVM)	PI (ET)	
4.4. Basic Life Support	PI		
4.5. Advanced Paediatric Life Support including ET	PI (BVM)	PI (ET)	
4.6. Heimlich, Foreign Body Removal	PI		
4.7. Exchange Transfusion	O	PS	PI
4.8. Stomach wash	PI		
4.9. Injections			
4.9.1. Intravenous	PI		
4.9.2. Intramuscular	PI		
4.9.3. Subcutaneous	PI		
4.9.4. Intradermal	PI		
4.10. Infusions			
4.10.1. IV bolus	PI		
4.10.2. Intravenous	PI		
4.10.3. Intraosseous	PI		
4.10.4. Blood Component Transfusion	PI		
4.11. Respiratory			
4.11.1. Meter dose inhalation with or without Spacer/Mask	PI		
4.11.2. Nebulization	PI		
4.11.3. Airway Insertion – Nasophy, Orophy	PI		
4.11.4. Needle Cricothyroidotomy	O	PS	PI
4.11.5. Oxygen delivery methods	PI		
4.11.6. HFNC/CPAP/Non-Invasive Ventilation	O, PS	PI	
4.11.7. Ventilation – Conventional, High Freq (HFV)	O	PS	PI (Not HFV)
4.11.8. Intercostal drainage	O, PS	PI	
4.11.9. Surfactant Administration	O, PS	PI	

	(INSURE)			
4.12.	Spinal infusion/injection	O	PS	PI
4.13.	Therapeutic Ascitic Tap	O, PS	PI	
4.14.	Peritoneal dialysis	O	PS	PI
4.15.	Phototherapy	PI		
4.16.	Incision and Drainage	O	PS	PI
4.17.	Dressings	PI		
4.18.	Sling	PI		
4.19.	Transport onto and off stretcher	PI		
4.20.	Neonatal Temperature Warm Chain	PI		
4.20.1.	Wrapping up Newborn	PI		
4.20.2.	Kangaroo Mother Care	PI		
4.21.	Immunization Cold Chain Measures			
4.21.1.	Refrigerator	PI		
4.21.2.	Vaccine carrier	PI		
4.22.	Restraining a child	O, PS	PI	
4.23.	Transporting a child	O, PS	PI	
4.24.	Early Interventional Therapy	O	PS	PI
4.25.	Chest Physiotherapy	O, PS	PI	

C. Predominant in Affective Domain

Should be able to effectively and empathetically……..

1. Communication – Child/Attender/Guardian

1.1. Elicit a relevant and appropriate historyfrom an attender/child including family and support systems

1.2. Engage and explainsin appropriate language the plan (diagnostic and management including economics of plans)to an attender/child

1.3. Explain the prognosis of the child's condition

1.4. Educatea Parent, an attendant/guardian/child with regards disease/, cultural, and spiritual understanding associated with health care delivery complication prevention, health promotion, and management keeping illustrating ethical ---?

1.5. Counsel towards an Informed Consent/Assent

1.6. Communicate disturbing/bad news including death

1.7. Demonstrates communication skills to appropriately word reports, professional opinions, patient education and counseling with regards

1.7.1. Health and Disease condition with management plan

1.7.2. Nutrition - Breastfeeding, complimentary feeding and nutrition using a Growth chart

1.7.3. Immunization – On schedule, catch up including costs and advantages/disadvantages

1.7.4. Lifestyle

1.7.4.1. Dietary

1.7.4.2. Habits

1.7.5. Genetic risks of relevant inherited conditions

1.7.6. Options for management and future approach in care with advantages and disadvantages

1.7.7. Rights and responsibilities

1.8. Demonstrates knowledge or applies an understanding of psychological, social, and economic factors which are pertinent to the delivery of health care.

1.9. Demonstrates and effectively engages the patient and / or family in all communication.

1.10. Demonstrates ability to provide patient, family and community education through written material especially simple patient information leaflets

Should be able to effectively and respectfully……..

2. Communication – Health Team members

2.1. Communicate with all members of the health care team

2.2. Communicate with other members of the profession

2.3. Communicate with allied professionals associated with Health care

Should be able to ……..

3. Professionalism and Ethical Behaviour

3.1. Demonstrates Professional Conduct in patient care and research

3.1.1. Demonstrate respect for the Doctor-Patient relationship

3.1.2. Demonstrate respect for the Doctor-Health Care Team Member relationship

3.1.3. Demonstrateadherence to confidentiality and patient privacy in all communications in and outside the place of work.

3.1.4. Demonstrate respect of a patient's rights and decisions including the right to information and second opinion.

3.1.5. Demonstrate behaviour aligned with MCI/NMC code of ethics in all related dealings

3.1.6. Demonstrates personal and social responsibility/accountability in the provision ofhealth care at an individual, community and population level

3.1.7. Demonstrate an awareness of economic costs of health care in all dealings with patients.

3.1.8. Demonstrate adherence to research ethics guidelines in the conduct of patient related research.

3.1.9. Demonstrates work ethics while working in a health care team.

3.1.10. Demonstrates truthfulness, honesty and integrity in all interactions.

3.1.11. Provides care that surpasses personal beliefs and prejudices

3.1.12. Demonstrates appropriate etiquette in dealings with patients, relatives and other health personnel

3.2. Demonstrates behavior that is Ethical and bound by the Law of the land

3.2.1. RecognizesEthical conflicts and dilemmas seeking solutions to reduce conflicts and do the right thing.

3.2.2. Complies with legal requirements while dealing with child health and includes issues dealing with the Industry Conflict, MTP Act,PCPNDT act, Child Abuse, Child labour, Legal adoption, Consent and Assent.

D. Pedagogic and Research Skills

Should be able to effectively ……..

1. **Pedagogic Skills**

1.1. Conduct a small group learning session (Theory and Practical) using appropriate tools

1.2. Create and use an effective Powerpoint Presentation

1.3. Present to a large group

Should be able to effectively ……..

2. **Research Skills**

2.1. Search scientific literature and critically appraise the evidence using standard study design checklists enabling application to clinical care.

2.2. Justify the application of the findings of a research study in clinical practice (Diagnostic and Therapeutic Studies)

2.3. Develop a research hypothesis supported by scientific literature review, design an appropriate study, implement the methodology, generate results by analyzing data, and draw appropriate conclusions.

2.4. Should be able to present or/and publish a paper based on the conducted research.

TEACHING AND LEARNING METHODS

General principles

Acquisition of competencies being the keystone of doctoral medical education, such training should be skills oriented. Learning in the program, essentially autonomous and self-directed, and emanating from academic and clinical work, shall also include assisted learning. The formal sessions are meant to supplement this core effort.

All students joining the postgraduate (PG) courses shall work as full-time (junior) residents during the period of training, attending not less than 80% of the training activity during the calendar year, and participating in all assignments and facets of the educational process. They shall maintain a logbook for recording the training they have undergone, and details of the procedures done during laboratory and clinical postings in real time.

Teaching-Learning methods

This should include a judicious mix of demonstrations, symposia, journal clubs, clinical meetings, seminars, small group discussion, bed-side teaching, case-based learning, simulation-based teaching, self-directed learning, integrated learning, interdepartmental meetings and any other collaborative activity with the allied departments. Methods with exposure to the applied aspects of the subject relevant to basic/clinical sciences should also be used. **The suggested examples of teaching-learning methods are given below but are not limited to these.**

A. Lectures: Didactic lectures should be used sparingly. A maximum of 10 lectures per year in the concerned PG department is suggested. All postgraduate trainees are encouraged to attend such lectures. Lectures can cover topics such as:

1. Subject-related important topics as per Paediatric requirements

2. Recent advances
3. Research methodology and biostatistics
4. Undergraduate/Postgraduate medical curriculum
5. Teaching and assessment methodology.

Topic numbers 3, 4, 5 can be done during research methodology/biostatistics and medical education workshops in the institute.

B. Journal club: Minimum of once in 1- 2 weeks is suggested.

Topics will include presentation and critical appraisal of original research papers published in peer reviewed indexed journals. The presenter(s) shall be assessed by faculty and grades recorded in the logbook.

C. Student Seminar: Minimum of once in 1-2 weeks is suggested.

Important topics should be selected as per subject requirements and allotted for in-depth study by a postgraduate student. A teacher should be allocated for each seminar as faculty moderator to help the student prepare the topic well. It should aim at comprehensive complete evidence-based review of the topic. The student should be graded by the faculty and peers. Symposium, Colloquium and Seminars may overlap to enhance involvement and active participation of postgraduates.

D. Student Symposium: Minimum of once every 3 months.

A broad topic of significance should be selected, and each part shall be dealt by one postgraduate student. A teacher moderator should be allocated for each symposium and moderator should track the growth of students. The symposium should aim at an evidence-based exhaustive review of the topic. All participating postgraduates should be graded by the faculty and peers. Symposium, Colloquium and Seminars may overlap to enhance involvement and active participation of postgraduates.

E. Bedside clinics: Minimum - once a week.

Clinics/bedside teaching should be coordinated and guided by faculty from the department. Various methods like DOAP (Demonstrate, Observe, Assist, Perform), simulations in skill lab, and case-based discussions etc. are to be used. Faculty from the department should participate in moderating the teaching-learning sessions during clinical rounds.

F. Interdepartmental colloquium

Faculty and students must attend monthly meetings between the main Department and other department/s on topics of current/common interest or clinical cases. Symposium, Colloquium and Seminars may overlap to enhance involvement and active participation of postgraduates.

G. a. Rotational clinical / community / institutional postings

Final decision that determines "external" postings outside the primary department will differ according to department needs, feasibility, sub-speciality availability and accessibility. Apart for mandatory postings, 'external' postings listed below are highly recommended (desirable) to expose postgraduates to allied Pediatric sub-specialities given existing trends in practice. Specific Learning Outcomes need to be defined for each of these postings even assessed keeping in mind the Competency based curriculum and their future professional roles as Pediatricians.

Rotations are listed below:

Mandatory Postings

- Paediatric emergency (minimum 1 month a year)
- Neonatology (NICU) (minimum 3 months a year)
- Intensive Care (PICU) (minimum 2 months a year)
- District Residency Programme with participation in Community Outreach Child Health Programs (at least 3 months over the entire course; 3rd or 4th or 5th semester; See Section G-b below).

Desirable postings based on need, availability, accessibility, and feasibility and may be innovatively integrated into schedule of posting to optimize learning experiences.

- Subspecialities Outpatient Clinics / observing- assisting in emergency
    - Clinical
        - Child Psychiatry
        - Pediatric Surgery
        - Developmental Pediatrics
        - Pediatric Nephrology
        - Pediatric Hemato-oncology
        - Pediatric Cardiology
        - Pediatric Gastroenterology
        - Pediatric Rheumatology/Immunology/Allergy
        - Genetic
        - Pediatric Pulmonology
        - Pediatric Dermatology
        - Pediatric Endocrinology
        - Adolescent Health

- DOTS, PPTCT, ART center with pediatric exposure
- Microbiology diagnostic Lab
- Radiology including CT/MRI
- Forensic Medicine especially Child related
- Neuro-rehabilitation (PMR, Physiotherapy, Occupational Therapy)

G b.Posting under "District Residency Programme" (DRP):

All postgraduate students pursuing MD/MS in broad specialities in all Medical Colleges/Institutions shall undergo a compulsory rotation of three months in District Hospitals/District Health System as a part of the course curriculum, as per the Postgraduate Medical Education (Amendment) Regulations (2020). Such rotation shall take place in the 3rd or 4th or 5th semester of the Postgraduate programme and the rotation shall be termed as "District Residency Programme" and the PG medical student undergoing training shall be termed as "District Resident".

Every posting should have its defined learning objectives. It is recommended that the departments draw up objectives and guidelines for every posting offered in conjunction with the collaborating department/s or unit/s. This will ensure that students acquire expected competencies and are not considered as an additional helping hand for the department / unit in which they are posted. The PG student must be tagged along with those of other relevant departments for bedside case discussion/basic science exercises as needed, under the guidance of an assigned faculty.

H. Teaching research skills

Writing a thesis should be used for inculcating research knowledge and skills. All postgraduate students shall conduct a research project of sufficient depth to be presented to the University as a postgraduate thesis under the supervision of an eligible faculty member of the department as guide and one or more co-guides who may be from the same or other departments.

In addition to the thesis project, every postgraduate trainee shall participate in at least one additional research project that may be started or already ongoing in the department. It is preferable that this project will be in an area different from the thesis work. For instance, if a clinical research project is taken up as thesis work, the additional project may deal with community/field/laboratory work. Diversity of knowledge and skills can thereby be

reinforced. There should be periodic department review of the thesis work, as per following schedule:

- End of 6 months — Submission of protocol
- During 2ndyear — Mid-term presentation
- 6 months prior to examination — Final presentation; submission

I. Training in teaching skills

MEU/DOME should train PG students in education methodologies and assessment techniques. The PG students shall conduct UG classes in various courses and a faculty shall observe and provide feedback on the teaching skills of the student.

J. Log book

During the training period, the postgraduate student should maintain a Log Book indicating the duration of the postings/work done in Wards, OPDs, Casualty and other areas of posting. This should indicate the procedures assisted and performed and the teaching sessions attended. The logbook entries must be done in real time. The logbook is thus a record of various activities by the student like: (1) Overall participation & performance, (2) attendance, (3) participation in sessions, (4) record of completion of pre-determined activities, and (5) acquisition of selected competencies.

- The purpose of the Log book is to:
  a) help maintain a record of the work done during training,
  b) enable Faculty/Consultants to have direct information about the work done and intervene, if necessary,
  c) provide feedback and assess the progress of learning with experience gained periodically.

The Logbook should be used in the internal assessment of the student, should be checked and assessed periodically by the faculty members imparting the training. The PG students will be required to produce completed logbook in original at the time of final practical examination. It should be signed by the Head of the Department. A proficiency certificate from the Head of Department regarding the clinical competence and skillful performance of procedures by the student will be submitted by the PG student at the time of the examination.

The PG students shall be trained to reflect and record their reflections in logbook particularly of the critical incidents. Components of good teaching practices must be assessed in all academic activity conducted by the PG student and at least two sessions dedicated for assessment of teaching skills must be conducted every year of the PG program. The teaching faculty are referred to the MCI Logbook Guidelines uploaded on the Website.

K. **Course in Research Methodology**: All postgraduate students shall complete an NMC recognized course in Research Methodology within six months of the commencement of the batch and generate the online certificate on successful completion of the course.

Other aspects

- The Postgraduate trainees must participate in the teaching and training program of undergraduate students and interns attending the department.
- Trainees shall attend accredited scientific meetings (CME, symposia, and conferences) at least once a year.
- Department shall encourage e-learning activities.
- The Postgraduate trainees should undergo training in Basic Cardiac Life Support (BCLS), Neonatal Resuscitation, Advanced Pediatric Life Support and Adult Advanced Cardiac Life Support (ACLS).
- The Postgraduate trainees must undergo training in information technology and use of computers.

During the training program, patient safety is of paramount importance; therefore, relevant clinical skills are to be learnt initially on the models, later to be performed under supervision followed by independent performance. For this purpose, provision of skills laboratories in medical colleges is mandatory.

5. ASSESSMENT

FORMATIVE ASSESSMENT ie., assessment to improve learning

Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self-directed learning and ability to practice in the system.

General Principles

Internal Assessment should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills.

The Internal Assessment should be conducted in theory and practical/clinical examination, should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills.

Quarterly assessment during the MD training should be based on:

- Case presentation, case work up, case handling/management : once a week
- Laboratory performance : twice a week
- Journal club : once a week
- Seminar : once a fortnight
- Case discussions : once a fortnight/month
- Interdepartmental case or seminar : once a month

Note: These sessions may be organized and recorded as an institutional activity for all postgraduates.

- Attendance at Scientific meetings, CME programmes (at least 02 each)

For Knowledge Assessments, *Patient case scenario presentations and discussions including interdepartmental sessions remain the cornerstone of Paediatric learning focused on critical thinking and clinical reasoning. This is also ideally achieved during teaching at the bedsides on rounds and in ambulatory settings such as outpatient clinics if not emergency. Clinical Pathologic Case discussions, Mortality-Morbidity discussions and Prescription-Medication Order Audits are of great value and are encouraged to improve quality of care as well teaching-learning preferably scheduled every month to routine educational program.*

For Psychomotor and Affective/Communication Assessments*, consider the use of OSCEs, DOPs and even mini-CEX that one may strengthen Formative Feedback/Assessments.*

The student to be assessed periodically as per categories listed in appropriate (non-clinical/clinical) postgraduate student appraisal form (Annexure I).

SUMMATIVE ASSESSMENT ie., assessment at the end of training

Essential pre-requisites for appearing for examination include:

1. **Log book** of work done during the training period including rotation postings, departmental presentations, and internal assessment reports should be submitted.

2. At least one if not two presentation(s) at national/state level conference. If not presented at national level, alternatively, one research paper should be published / accepted in an indexed journal**.** (It is suggested that the local or University Review committee assess the work sent for publication).

The summative examination would be carried out as per the Rules given in the latest POSTGRADUATE MEDICAL EDUCATION REGULATIONS. The theory examination shall be held in advance before the Clinical and Practical examination, so that the answer books can be assessed and evaluated before the commencement of the clinical/Practical and Oral examination**.**

The postgraduate examination shall be in three parts:

1. **Thesis**

   Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination. The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination. A post graduate student in broad specialty shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners**.**

2. **Theory examination**

   The examinations shall be organized based on 'Grading' or 'Marking system' to evaluate and to certify post graduate student's level of knowledge, skill and competence at the end of the training, as given in the latest POSTGRADUATE MEDICAL EDUCATION REGULATIONS. Obtaining a minimum of 50% marks in 'Theory' as well as 'Practical' separately shall be mandatory for passing examination. The examination for M.D./ M.S shall be held at the end of 3rd academic year.

   There shall be 4 theory papers (as per PG Regulations).

   Paper I: Basic Sciences as related to the subject

Paper II: General Paediatrics

Paper III: Systemic Paediatrics

Paper IV: Recent Advances

3. Practical/clinical and Oral/viva voce examination

Practical examination

Practical examination should be as per concerned university regulation.

Oral/Viva voce examination shall be comprehensive enough to test the post graduate student's overall knowledge of the subject focusing on psychomotor and affective domain.

The final clinical examination in broad specialty clinical subjects should include:

- Cases pertaining to major systems (eg. one long case and three short cases)
- OSCE Stations to cover clinical, procedural and communication skills
- Logbook Records and reports of day-to-day observation during the training
- It is emphasized that Oral/viva voce examination shall be comprehensive enough to test the post graduate stu overall knowledge of the subject.

RECOMMENDED READING:

Books (latest edition)

1. Nelson Textbook of Pediatrics, Ed: Kliegman RM, St. Geme J. Elsevier.
2. PG Textbook of Pediatrics, Ed: Gupta P, Menon PSN, Ramji S, Lodha R. Jaypee
3. Rudolph's Pediatrics, Ed: Kline MW, McGraw Hill.
4. Textbook of Clinical Neonatology (IAP/NNF), Ed: Pejavar RK, Thakre R. Paras.
5. Cloherty and Stark's Manual of Neonatal Care. Ed: Eichenwald EC, Hansen AR, Martin CR, Stark AR. Wolters Kluwer.
6. Principles of Pediatric& Neonatal Emergencies (IAP). Ed: Gupta P, Bagga A, Ramji S, Chugh K, Lodha R, Dewan P, Kaushik JS, Shah D. Shah. Jaypee.
7. Clinical Methods in Pediatrics. Gupta P. CBS Publisher.
8. The Harriet Lane Handbook. Hughes HK, Kahl LK, Elsevier.
9. Nutrition and Child Development. Elizabeth KE. Paras Medical Publisher.
10. Illingworth's Development of The Infant and The Young Child. Au: Illingworth RS; Elsevier Health.

11. Fenichel's Clinical Pediatric Neurology. Au: Piña-Garza JE, James KC. Elsevier.
12. Park's Pediatric Cardiology for Practitioners. Myung Park M, Salamat M. Elsevier.
13. Lanzkowsky's Manual of Pediatric Hematology and Oncology. Fish J, Lipton J, Lanzkowsky P. Elsevier.
14. Essential Paediatric Pulmonology. Lodha R, Kabra SK. Jaypee.
15. Textbook of Pediatric Rheumatology. Petty RE, Laxer R, Lindsley C, Wedderburn L, Fuhlbrigge RC, Mellins ED. Elsevier.

Journals

03-05 international Journals and 02 national (all indexed) journals.

Online Resources

a. IAP https://www.iapindia.org/https://diapindia.org/
b. GOI MOHFW and IIPS. http://rchiips.org/nfhs/
c. Pubmed. https://pubmed.ncbi.nlm.nih.gov/
d. Google Scholar. https://scholar.google.co.in/
e. Cochrane. https://www.cochranelibrary.com/
f. Uptodate. https://www.uptodate.com/login
g. Clinical Key. https://www.clinicalkey.com/#!/login
h. Medscape. https://www.medscape.com/
i. JM Rey's IACAPAP e-Textbook of Child and Adolescent Mental Health. Rey JM, Martin A. International Association for Child and Adolescent Psychiatry and Allied Professions. ISBN 9780646574400 Free on https://iacapap.org/english/

Annexure I

Student appraisal form for MD in Pediatrics											
	Elements	**Less than Satisfactory**			**Satisfactory**			**More than satisfactory**			**Comments**
		1	2	3	4	5	6	7	8	9	
1	**Scholastic Aptitude and Learning**										
1.1	Has Knowledge appropriate for level of training										
1.2	Participation and contribution to learning activity (e.g., Journal Club, Seminars, CME etc)										
1.3	Conduct of research and other scholarly activity assigned (e.g. Posters, publications etc.)										
1.4	Documentation of acquisition of competence (eg Log book)										
1.5	Performance in work based assessments										
1.6	Self- directed Learning										
2	**Care of the patient**										
2.1	Ability to provide patient care appropriate to level of training										
2.2	Ability to work with other members of the health care team										
2.3	Ability to communicate appropriately and empathetically with patients families and care givers										
2.4	Ability to do procedures appropriate for the level of training and assigned role										
2.5	Ability to record and document work accurately and appropriate for level of										

	training										
2.6	Participation and contribution to health care quality improvement										
3	**Professional attributes**										
3.1	Responsibility and accountability										
3.2	Contribution to growth of learning of the team										
3.3	Conduct that is ethically appropriate and respectful at all times										
4	**Space for additional comments**										
5	**Disposition**										
	Has this assessment been discussed with the trainee?	Yes	No								
	If not explain										
	Name and Signature of the assesse										
	Name and Signature of the assessor										
	Date										

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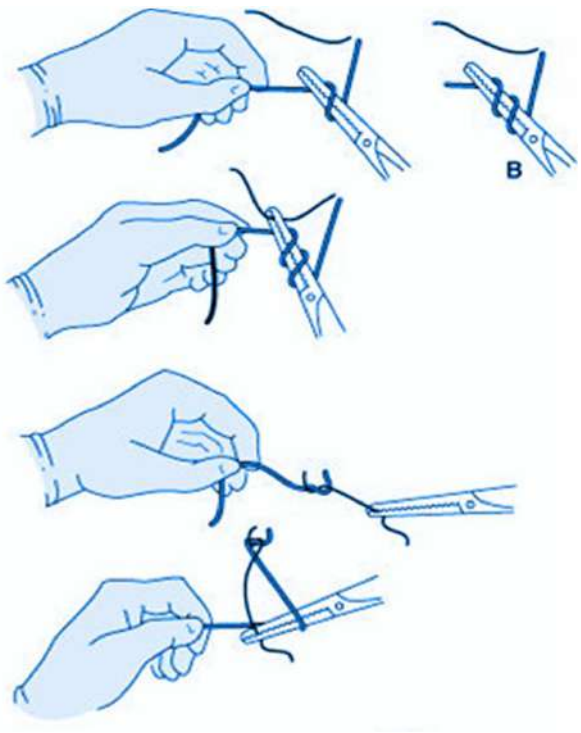
COMPETENCY BASED UNDERGRADUATE CURRICULUM
FOR THE INDIAN MEDICAL GRADUATE

Knows Knows how Shows Shows how Performs

Describe Observe Demonstrate
Enumerate Assist



Counsel Prescribe

Analyse Integrate

Guide Communicate

Correlate Interpret

Critique Collaborate

Module 5

Skills Training

Clinician Communicator Team Leader Professional Lifelong Learner

Knowledge | Skills | Attitude | Values | Responsiveness | Communication

Curriculum Implementation Support Program

Skills Training Module

(Including Guidelines for Skills Lab)

For Undergraduate Medical Education

Program

2019

Medical Council of India
Pocket-14, Sector-8, Dwarka,
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BOARD OF GOVERNORS
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Skills module

Foreword

Clinicians are defined by their skill sets. From listening to procedures the continuum of skills that are garnered by learners and doctors are myriad. There is a compelling need to focus on observable and measurable skill acquisition in the MBBS program.

The emphasis on skill acquisition is one of the key features of the competency based curriculum and in many ways is its soul. The competency based undergraduate curriculum provides a framework for learning and assessing skills. The curriculum will necessitate a paradigm shift in medical education in India and requires teachers and education administrators alike to re-think the construct and delivery of instruction, like: 1) what are the skills that must be taught, 2) how to create the right environment in which skills can be taught, practiced, observed and assessed, 3) what are the facilitatory skills that teachers must acquire, 4) how should acquisition of skills be documented, and 5) how would the acquisition or non-acquisition of skills affect the progress of the learner?

A skills lab is a safe environment in which learners can acquire and practice skills and be observed and assessed. A skills lab that provides this environment is an important step in helping learners acquire skills – procedural, communication or others. The establishment of a basic skills lab that is in alignment with the requirements of the competency based curriculum must be established by all medical colleges, if the implementation of the new undergraduate curriculum is to be successfully implemented. This will also provide the faculty with the support mechanisms to adapt to these new changes and requirements.

The skills module developed by the Expert Group of MCI is a compilation of best practices and is a guide to teaching skills needed to implement the competency based curriculum. Institutions, educators and teachers are encouraged to use this guide to help facilitate skill acquisition by learners. We also solicit your innovations and best practices so that these can be shared with institutions and teachers across the nation.

Chairman, Board of Governors

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Foreword

Skills module

A key feature of the Regulations in Graduate Medical Education Part II is the emphasis on an outcome driven education with emphasis on acquisition of competencies. The skills, knowledge and practice acquired by the Indian Medical Graduate to deal with the health problems of the community, particularly in the context of a number of newly emerging and re-emerging diseases, is a challenge to medical educationists. This situation necessitates that the student-learner should have acquired competent and verifiable skills at the time of graduation. Acquisition of these skills, which include cognitive, procedural, and communication skills require dedicated teaching learning practices and time in a supervised environment. The primacy of patient safety also necessitates that practice of skill acquisition, its usage and assessment are done in a safe environment under peer supervision and should be a planned collaborative activity of the institution. The Medical Council of India has thus felt that every medical college should establish an adequately equipped skills lab and provide resources and opportunities so that these can be meaningfully used to improve the skill outcomes of the medical graduate.

This booklet on skills module has been designed to help institutions meet the challenge of transforming the learning environment to align with the requirements of implementation of the competency driven undergraduate curriculum. This module has been written and diligently scrutinised by members of the Expert group. The Medical Council of India hopes that medical institutions would find this a useful resource material as they make the momentous transition to the teaching of the new undergraduate curriculum.

Vats

(Dr. R. K. Vats)
Secretary General

Module – 5

SKILLS TRAINING

Skills Training Module

1. Objective of the Document

The objective of the document is to facilitate institutions and faculty to develop and implement skills training as part of implementation of new Undergraduate Curriculum.

2. Glossary of Terms Used in the Document

Skill: Skill is the ability to perform a task leading to a specific predefined outcome.

Skill may be:

a) Intellectual or cognitive which includes clinical reasoning and decision making skills,

b) Procedural or psychomotor skills that require manual dexterity and include laboratory and clinical skills,

c) Communication skills,

d) Team skills including leadership skills.

Competency: The habitual and judicious use of communication, knowledge, technical skills, clinical reasoning, attitude, values, and reflection in daily practice for the benefit of the individual and the community being served.

Skill Assessment: A session that assesses the skill of the student including those in the laboratory, bed-side, skills lab, skills station that uses mannequins/ paper cases/simulated patients/real patients as the context demands.

DOAP (Demonstration -Observation - Assistance - Performance): A practical session that allows the student to observe a demonstration, assist the performer, perform in a simulated environment, perform under supervision or perform independently.

3. Introduction

The current undergraduate medical education curriculum focuses on competencies and outcomes and gives emphasis to skill development in all phases. The competencies ‘Shows How’ (SH) or ‘Perform’ (P) are listed in relation to the skills to be acquired by the learner. The Graduate Medical Education Regulations Part II, 2019 envisages that certain skills are prerequisites for graduation. Therefore, it is necessary for institutions to create skill sessions in which essential/ desirable and certifiable skills are acquired. These skill sessions should be planned during their respective phase in a laboratory/during clinical posting. There should be proper documentation of the process of acquisition of skills. When required, a skills lab may be used to impart training. Skills lab provides a safe training environment in which a learner can be observed and be provided with the feedback necessary to improve. It also allows the learner to do tasks repetitively under supervision till the desired level of competency is achieved.

4. Salient Principles

The undergraduate medical education program is designed with a goal to create an “Indian Medical Graduate” (IMG) possessing the requisite knowledge, skills, attitudes, values and responsiveness, so that he or she may function appropriately and effectively as a physician of first contact of the community while being globally relevant.

The principles governing skill acquisition have been presented in this module which also facilitate the utilization of ‘Skills lab’ during the undergraduate training and assessment.

This module helps to:

a) understand the link between competency and skill,

b) enumerate the general principles of skill acquisition,

c) explain how to apply these principles,

d) understand the different methods and steps of skills teaching and acquisition (skill cycle),

e) develop skill sessions from a given competency, and

f) impart, assess and document the acquisition of these skills.

The module also elaborates the concepts, processes, resources and organizational set up for a basic skills lab in a college setting.

Context from GMER 2019

2.2.2 All efforts must be made to equip the medical graduate to acquire the skills as detailed in Table 11 Certifiable procedural skills – A Comprehensive list of skills recommended as desirable for Bachelor of Medicine and Bachelor of Surgery (MBBS) – Indian Medical Graduate.

4.1.4. Clinical training shall emphasize early clinical exposure, skill acquisition, certification in essential skills; community/primary/secondary care-based learning experiences and emergencies.

4.1.6. Acquisition and certification of skills shall be through experiences in patient care, diagnostic and skill laboratories.

4.1.8. Progress of the medical learner shall be documented through structured periodic assessment that includes formative and summative assessments. Logs of skill-based training shall be also maintained.

4.2. Appropriate Faculty Development Programmes shall be conducted regularly by institutions to facilitate medical teachers at all levels to continuously update their professional and teaching skills, and align their teaching skills to curricular objectives.

10.5.1. Initiate appropriate cost-effective treatment based on an understanding of the rational drug prescriptions, medical interventions required and preventive measures.

Certifiable Procedural Skills, as given in GMER 2019 are given below:

Table 11 (GMER 2019): Certifiable Procedural Skills:

A Comprehensive list of skills recommended as desirable for Bachelor of Medicine and Bachelor of Surgery (MBBS) – Indian Medical Graduate

Specialty	Procedure
General Medicine	• Venipuncture (I) • Intramuscular injection (I) • Intradermal injection (D) • Subcutaneous injection (I) • Intra Venous (IV) injection (I) • Setting up IV infusion and calculating drip rate (I) • Blood transfusion (O) • Urinary catheterization (D) • Basic life support (D) • Oxygen therapy (I) • Aerosol therapy / nebulization (I) • Ryle's tube insertion (D) • Lumbar puncture (O) • Pleural and ascitic aspiration (O) • Cardiac resuscitation (D) • Peripheral blood smear interpretation (I) • Bedside urine analysis (D)
General Surgery	• Basic suturing (I) • Basic wound care (I) • Basic bandaging (I) • Incision and drainage of superficial abscess (I) • Early management of trauma (I) and trauma life support (D)
Orthopedics	• Application of basic splints and slings (I) • Basic fracture and dislocation management (O) • Compression bandage (I)

Gynecology	• Per Speculum (PS) and Per Vaginal (PV) examination (I) • Visual Inspection of Cervix with Acetic Acid (VIA) (O) • Pap Smear sample collection & interpretation (I) • Intra- Uterine Contraceptive Device (IUCD) insertion & removal (I)
Obstetrics	• Obstetric examination (I) • Episiotomy (I) • Normal labor and delivery (including partogram) (I)
Pediatrics	• Neonatal resuscitation (D) • Setting up Pediatric IV infusion and calculating drip rate (I) • Setting up Pediatric Intraosseous line (O)
Forensic Medicine	• Documentation and certification of trauma (I) • Diagnosis and certification of death (D) • Legal documentation related to emergency cases (D) • Certification of medical-legal cases e.g. Age estimation, sexual assault etc. (D) • Establishing communication in medico-legal cases with police, public health authorities, other concerned departments, etc. (D)
Otorhinolaryngology	• Anterior nasal packing (D) • Otoscopy (I)
Ophthalmology	• Visual acuity testing (I) • Digital tonometry (D) • Indirect ophthalmoscopy (O) • Epilation (O) • Eye irrigation (I) • Instillation of eye medication (I) • Ocular bandaging (I)

Dermatology	• Slit skin smear for leprosy (O) • Skin biopsy (O) • Gram's stained smear interpretation (I) • KOH examination of scrapings for fungus (D) • Dark ground illumination (O) • Tissue smear (O) • Cautery - Chemical and electrical (O)

I- Independently performed on patients,
O- Observed in patients or on simulations,
D- Demonstration on patients or simulations and performance under supervision in patients

Certification of Skills: Any faculty member of concerned department can certify skills. For common procedures, the certifying faculty may be decided locally.

5. Major Components and Structure of the Skill Development program

Skill was the term used traditionally to denote procedural skill. However, there has been a paradigm shift and in the present context, it is the ability to perform a task leading to a specific predefined outcome in several domains.

Classification of Skills-

Skills are classified as:

a) **Intellectual or cognitive skills** are defined as abilities such as application, analysis and synthesis as building on basic knowledge and are related to underlying component of knowledge.

e.g. ability to interpret haematological tests of a patient with anemia

b) **Psychomotor or procedural skills** (require manual dexterity and include laboratory and clinical skills

e.g. ability to obtain a blood sample by venepuncture

c) **Communication skills** is defined as the ability to communicate with others in a given situation.

e.g. ability to motivate volunteers for blood donation

d) **Team Skill** is defined as the ability to work together in a team.

e.g. Ability to work towards implementing a project/operating on a patient with the team.

Link between competency and skills

Competency based medical education is outcome oriented. The learner is expected to be able to demonstrate achievement of predefined outcomes including skills. The competency based curriculum document on skills defines levels of competence for different skills from mere awareness to successful performance (K/KH/SH/P). It is necessary therefore to create learning experiences that will allow the learner to attain the predefined level of outcome. For competencies that require an 'SH', or 'P' level of competence, provision of a learning experience that will allow performance of the skill repeatedly under supervision is critical. It should be also noted that the acquisition of the skill and its correct performance must be documented and assessed.

The general principles of skill acquisition and its application are:

a) Outcome is predefined for the phase and level of training,

b) Standard approved process of acquisition including required steps are clearly outlined,

c) Learners are provided opportunity to progressively acquire and practice repeatedly under supervision, in a structured format and in a safe, non-threatening environment, and

d) Opportunities are made available for self-assessment and improvement, feedback and assessment of performance.

Developing a skill session from a competency, methods of skill teaching and steps of skill acquisition

It is important to determine the criticality and feasibility of the skill being taught, as given in Figure 1.

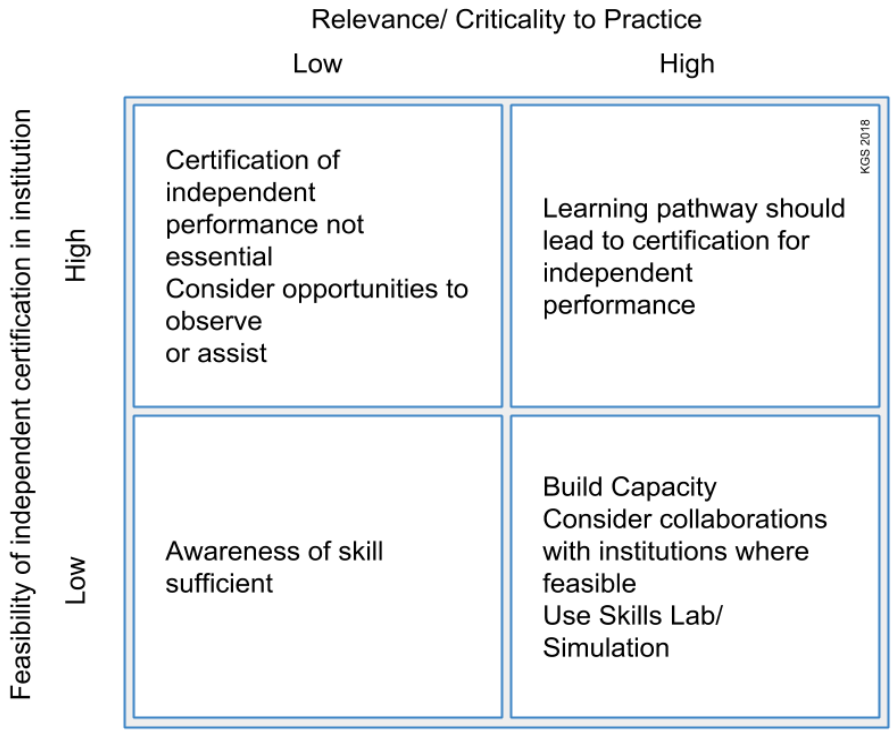


Figure I: Criticality vs feasibility matrix in context to Skills training

Explanation of the criticality vs feasibility matrix with examples from the new undergraduate curriculum:

Example1: Competency of Phase I - PY11.14 -Demonstrate Basic Life Support in a simulated environment.

Domain of 'Skill' at the level of Shows How (SH). Suggested method is DOAP sessions and assessment using OSCE. Now in a real situation, the feasibility of independent performance by a learner may be low, but since the criticality is high, it is a must, to use a Skills lab for training using simulation.

Example 2: Competency of Phase III- EN3.2 - Observe and describe the indications for and steps involved in the performance of diagnostic nasal endoscopy.

Domain of 'Skill' is at the level of Knows How (KH). Suggested method being Lecture, Small group discussion, demonstration and assessment using Written/ Viva voce. Both the feasibility and criticality are low and hence awareness of this skill is sufficient and there is no need for skills training in this competency.

If the competency lends itself to skill acquisition across phases, the phase-wise objectives must be first enumerated. It must be remembered that the ultimate achievement of the competency may be in a later phase but several steps to achieving it phase-wise may be developed.

Example 3: 'performing and interpreting ECG':

In phase 1, the competencies related to this skill acquisition are:

PY 5.13: Record and interpret normal ECG in a volunteer or simulated environment- 'SH'

PY 5.6: Describe abnormal ECG, arrhythmias, heart block and myocardial Infarction- 'KH'

This skill is also addressed in the competencies of General Medicine and Pediatrics. If we take an example of acquiring this skill in adults, the following competencies in General Medicine are related to performing and interpreting ECG for various disorders:

- IM 1.17: Order and interpret diagnostic testing based on the clinical diagnosis including 12 lead ECG, Chest radiograph, blood cultures - 'SH'.
- IM 1.18: Perform and interpret a 12 lead ECG - 'P'.
- IM 2.10: Order, perform and interpret an ECG - 'P'.
- IM 8.13 Enumerate the indications for and interpret the results of: CBC, Urine routine, BUN, Cr, Electrolytes, Uric acid, ECG - 'KH'.
- IM 10.18: Identify the ECG findings in hyperkalemia - 'SH'.
- IM11.11: Order and interpret laboratory tests to diagnose diabetes and its complications including: glucose, glucose tolerance test, glycosylated hemoglobin, urinary micro albumin, ECG, electrolytes, ABG, ketones, renal function tests and lipid profile- 'SH'.
- IM 12.9: Order and interpret diagnostic testing based on the clinical diagnosis including CBC, thyroid function tests and ECG and radio-iodine uptake and scan - 'SH'.
- IM12.10: Identify atrial fibrillation, pericardial effusion and bradycardia on ECG - 'SH'.

In phase 1, while the student acquires the skill of recording and interpreting normal ECG in a volunteer/ simulated environment - to a level of *Shows How* 'SH', he will also gain knowledge of the various abnormal ECGs in arrhythmias, heart block, MI etc. Sensitization of the ECG findings in hyperkalemia, MI, heart failure, thyroid function, diabetes and its complications can also occur at *knows* - 'K' level. This may be achieved during the integration session while conducting teaching learning sessions of PY 5.6,& PY 5.13. It is important to remember that, since the completion of teaching of Phase 1 competency is the priority at this time, the students will be only sensitized to ECG findings in these conditions.

In phase 2, the General Medicine competencies will be dealt in bedside clinics after the students have received preliminary knowledge on these disorders integrated with knowledge in Pathology, Pharmacology, etc. During this phase, phase 2 subjects are primary, but at the same time, the General Medicine competencies are slowly developed towards the requirement of phase 3.

In phase 3, the teaching learning sessions are planned in such a way that each of the competencies mentioned earlier can be slowly progressed to *Shows How / Perform*, as the need may be. Also those competencies requiring a mandatory minimum number of times the skill is to be performed is also required to be documented for each student.

In each phase, learning sessions are derived based on the level of the phase-wise objectives. To ensure a progressive buildup of the competencies to phase 3 at the required level, it is important to have the objectives of phase 3 competencies in place, right at the beginning.

A lesson plan should be made for the learning session that includes objectives, resources, setting (clinical/ laboratory, need for skills lab), learning steps, supervision required, methods of assessment and documentation of the process of the skill acquisition using log/portfolios. These are summarized in Figures II & III.

Figure II: Approach to competency based skill development

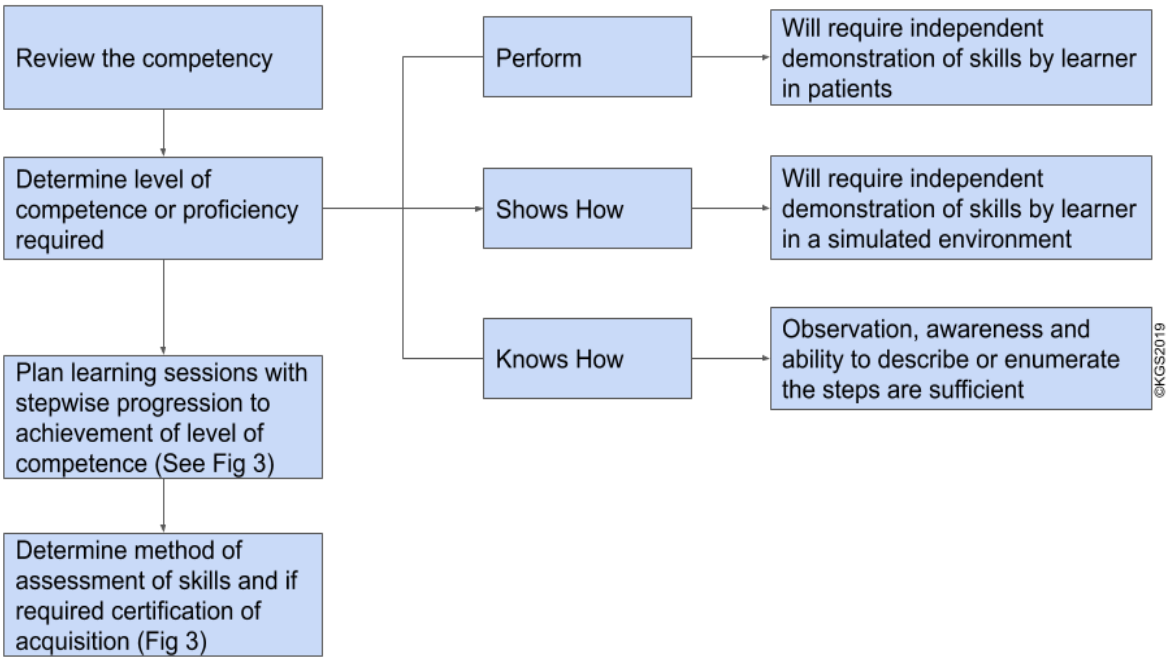
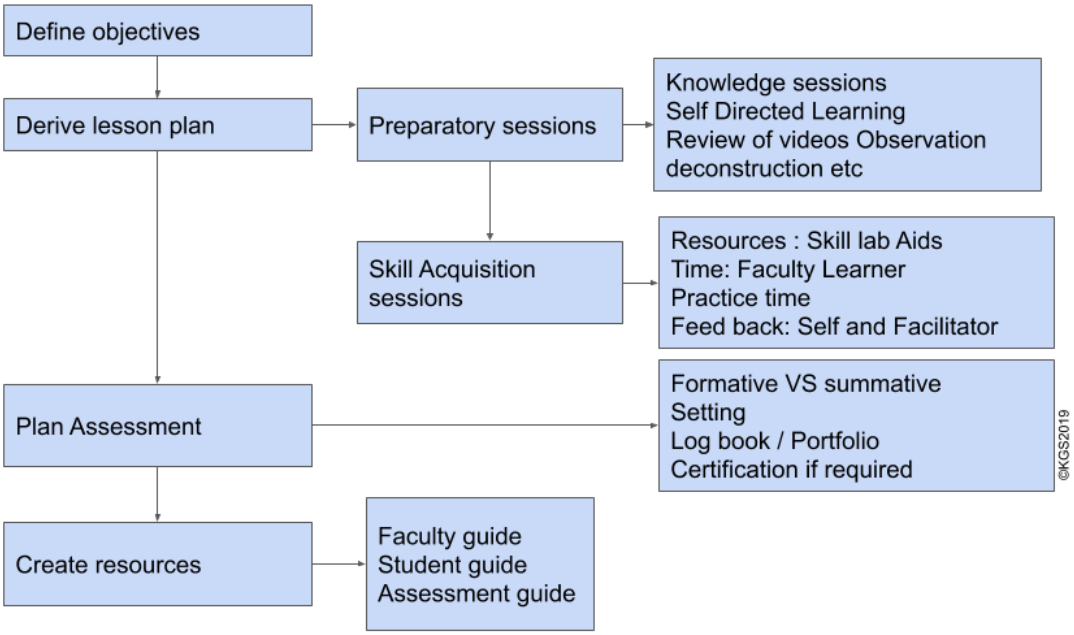


Figure III: Planning a skill session



A template of developing a competency which is skill based is enclosed as **Annexure A (Sample lesson Plan) which can be used as a guide to various subjects. Annexure B shows example of task training modules. This can be used by faculty members to develop specific task modules.**

Methods for teaching intellectual skills

Clinical reasoning is best taught during the course of a clinical encounter either conducted by the physician-teacher (for demonstration), or preferably by the student observing a clinical encounter. Clinical case presentations, case based discussions/ chart stimulated recall, clinical problem solving exercises and structured case presentation models like SNAPPS (Summarising, Narrowing the differential, Analyzing the differential, Probing the preceptor, Planning the management & Self-directed learning) and One Minute Preceptor are good settings for teaching clinical reasoning skills.

SNAPPS model can help learners build illness scripts essentially by way of comparing differential diagnoses and clarifications of uncertainties. This method encourages expression of intuitive as well as analytical thinking and promotes self-reflection by the student.

The One Minute Preceptor (OMP) model is another useful model of structured clinical case discussion. In this five-step micro-skills model, the student presents a case, he/she is then asked to commit to a diagnosis, and is probed for reasoning for the same. The preceptor (teacher), now aware of patient as well as student's diagnosis, appreciates what was done well, points out omissions and teaches general rules (e.g. key features, principles of management, effective communication). Usually, it takes about 10 minutes (arbitrary division of time could be: 6 minutes for case presentation, 3 minutes for questioning and 1 minute for teaching the general rule and feedback). Despite being a teacher initiated model, it drives the student to propose and justify the diagnosis, employing appropriate clinical reasoning skills by the learner (Jyoti Nath Modi et al., 2015).

Reflection and metacognition: Students must be encouraged and provided an opportunity to reflect on their diagnostic approach, and think about what they could be missing.

In addition to these methods, there are alternative ways of acquiring intellectual skills such as case discussions, seminars, small group discussions, critical incidence reporting, grand rounds, bed side teaching, assignments, symposia etc. which can be utilized.

Methods for teaching psychomotor skill:

There are various theories and methods of acquiring a psychomotor skill - Few of these methods are described below:

Peyton's Four-Step Approach has proven to be most helpful. Peyton's approach combines multiple aspects of learning theory.

The Four-Step Approach consists of the following four clearly defined steps:

1. The trainer demonstrates the skill in real time without giving instructions or explanatory words **("Demonstration").**
2. The trainer repeats the procedure, this time describing all necessary sub-steps **("Deconstruction").**
3. The trainer performs the skill for a third time, this time following the sub-steps only as described to him by the trainee **("Comprehension")**. This step has been identified as the most important step of the Four-Step Approach in the past as deeper processing mechanisms reflecting what was observed in the first two steps are necessary for the trainees' to be able to give instructions.
4. The trainee performs the skill on his/her own **("Performance")**.

   The learning in **Steps 1 and 2** is based on a social-cognitive approach to learning theory, whereas Step 4, the actual implementation and training of the procedure up to its successful application, is associated with the behaviorist learning theory.

The **third step** of Peyton's approach is crucial: The perceptually processed information (Step 1 & Step 2) must be actively manipulated in the working memory in Step 3 to be transferred into the long-term memory (Tobias Münster et al., 2016).

In addition to this method, there are alternative ways of acquiring psychomotor skills such as using demonstration, simulation, skills lab, use of models/ mannequins, performance under supervision, cadaveric labs, animal tissue labs, virtual reality, standardized patients, etc. which can be utilized.

Deliberate practice as elucidated by Ericsson (2004) includes finding opportunities for repeated practice, requesting honest feedback on performance at frequent intervals, maximizing learning from each case, reflecting on feedback and errors to improve performance and using mental practice to support clinical experiences. Deliberate practice involves (a) repetitive practice of the intended skill, combined with (b) the thorough assessment of the skill so that the learner (c) can receive specific, informative feedback, which results in an increasingly (d) better performance of skill. The provision of a safe environment for the learner to be observed while performing skills and providing constructive feedback is the critical component of skill acquisition.

When psychomotor skills training require/ necessitate exposure to body fluids or biological hazardous materials, students must be trained on the infection control / biosafety requirements beforehand. Procedures involving dangerous steps like mouth pipetting should be avoided or replaced with suitable other technologies / methods like bulb suction or vacuum aspiration etc. Use of non-hazardous materials must be encouraged.

Method and theory for communication skills

There are several theories involved in communication skills. A consensus statement from experts called the Kalamazoo declaration provides a simple framework that addresses the essential elements that form healthcare communication. These include

build a relationship; open the discussion; gather information; understand the patient's perspective; share information; reach agreement on problems and plans; and provide closure (Makoul, 2001).

The AETCOM module

The AETCOM module describes the competencies phase-wise and also mentions the suggested teaching learning methods with assessment(from AETCOM module (availableat: https://www.mciindia.org/CMS/wp-content/uploads/2019/01/ AETCOM_book.pdf), is reproduced below:

AETCOM Module 2.1: The foundations of communication - 2

Background Communication is a fundamental prerequisite of the medical profession and beside skills is crucial in ensuring professional success for doctors. This module continues to provide an emphasis on effective communication skills. During professional year II, the emphasis is on active listening and data gathering.

Competency addressed:

The student should be able to: Demonstrate ability to communicate to patients in a patient, respectful, non-threatening, non- judgmental and empathetic manner.

Level: SH

Learning Experience:

Year of study: Professional year 2

Hours: 5 (1 + 2 +1+1)

i. Introductory small group session - 1 hour

ii. Focused small group session - 2 hours

iii. Skills lab session – 1 hour

iv. Discussion and closure – 1 hour

Contents: This module includes 3 interdependent learning sessions:

1. Introductory small group session on the principles of communication with focus on opening the discussion, listening and gathering data.
2. Focused small group session with role play or videos where the students have an opportunity to observe, criticise and discuss common mistakes in opening the discussion, listening and data gathering.
3. Skills lab sessions where students can perform tasks on standardised or regular patients with opportunity for self critique, critique by patient and by the facilitator.

Methods for teaching team Skills

Team skills are enhanced by Immersive Learning. A learner is placed in a situation as a part of a team in an immersive simulated learning environment. His performance is monitored and multilevel feedback is provided, leading to the acquisition and enhancement of skills. For e.g. training students to work in an emergency situation can be taught by simulating an offsite emergency scenario where tasks are allotted to students as a team. The students are allowed to perform. This is observed by experts and following a debrief during which the students are allowed to reflect, they can also be assessed by the experts as a team and such a scenario is used for learning to act as an effective team.

6. Organizational set up

6.1 Guidelines for development of skills lab at medical colleges and training institutions have been detailed in Annexure C.

The basic requirements for a skills lab at a medical college are given below: Please refer to the Competency Based Undergraduate Curriculum for the IMG, Volumes I-III (2018) for an exhaustive list of subject based competencies which require skill training (accessible at: https://www.mciindia.org/CMS/wp-content/uploads/2019/01/UG-Curriculum-Vol-I.pdf)

1. Institutions are encouraged to build capacity over and above these minimum requirements.
2. Institutions within a geographical area or governance can create more advanced shared facilities and resources to reduce cost.

Communication skills training using AETCOM module should be conducted. Resuscitation skills of Basic Life Support (BLS), Advanced Cardiac Life support (ACLS), Pediatric Advanced Life Support (PALS), Neonatal Advanced Life Support (NALS), Advanced trauma Life Support (ATLS), prescription writing and communication skills along with being an effective team member and leader can be taught/trained using offsite simulation of simulated environments in an integrated manner.

Evaluation and Reporting: Program effectiveness questionnaire from faculty and students should be developed. Acquisition and certification of skills shall be through experiences in patient care, diagnostic and skill laboratories. A proper phase-wise logbook is recommended to ensure completion of competencies requiring skills training. Assessment of skills must be planned according to the level of competence desired. Details can be accessed at https://mciindia.org/CMS/wp-content/uploads/2019/10/Module_Competence_based_02.09.2019.pdf

6.2 Skill assessment:

Skill assessment is ongoing, formative and summative. Please refer to the module 3 of Medical Council of India on Assessment.

Recommended Reading:

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3. Bugaj TJ and Nikendei, C (2016). Practical Clinical Training in Skills Labs: Theory and Practice. GMS Journal for Medical Education, 33(4). Available at *https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5003146/pdf/JME-33-63.pdf* accessed on 19.11.2019.
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6. Ericson, K Anders (2004). Deliberate practice and acquisition and maintenance of expert performance in Medicine and related domain. Academic Medicine; 7: October Suppl. S70.
7. Furney SL, Orsini AL, Orsetti KE, et al. (2001). Teaching the one minute preceptor. A randomized controlled trial. J Gen Intern Med 16: 620-624. Available at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1495264/pdf/jgi_00924.pdf accessed on 19.11.2019.
8. Makoul G. (2001). Essential elements of communication in medical encounters: the Kalamazoo consensus statement. Acad Med. 76(4): 390–393).

9. Miller GE (1990). The assessment of clinical skills/competence/performance. *Academic Medicine,* 65(9) (Suppl), S63-S67. Available at *http://winbev.pbworks.com/f/Assessment.pdf,* accessed on19.11.2019.

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12. Reznick RK and MacRae H (2006). Teaching surgical skills- changes in the wind. N Eng J Med 355, 2664-69.

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14. Rita Sood and Tejinder Singh (2012). Assessment in medical education: Evolving perspectives and contemporary trends. National Medical Journal of India, 25: 357-364. Available at *http://archive.nmji.in/archives/Volume-25/Issue-6/Medical-Education-I.pdf* accessed on19.11.2019.

15. Syndney Smee (2003). ABC of Skill Learning. BMJ, 326: 703-6. Available at *https://www.bmj.com/content/326/7391/703* accessed on 19.11.2019

16. Tobias Münster, Christoph Stosch, Nina Hindrichs, Jeremy Franklin, and Jan Matthes (2016). Peyton's 4-Steps-Approach in comparison: Medium-term effects on learning external chest compression – a pilot study. GMS J Med Educ. 33(4).

17. Vogel Daniela and Harendza Sigrid (2016). Basic practical skills teaching and learning in undergraduate medical education – a review on methodological evidence. GMS Journal for Medical Education 33 (4), Doc 64. Available at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5003143/pdf/JME-33-64.pdf accessed on 19.11.2019.

18. WHO/WFME accreditation of medical education, Basic Medical Education - WFME Global Standards for Quality Improvement. Available at *https://wfme.org/publications/wfme-global-standards-for-quality-improvement-bme* accessed on 19.11.2019.

Annexure A

Outline of a Session Plan

Annexure A

Outline of a Session Plan

Name of the group:

Facilitator/ Supervisor/ Faculty:

Parameter	Description
Name of the lesson	
Number of learners	
Objectives of the session	
Primary teaching method chosen	
Break up of the session	Step 1 Step 2 Step 3 Step 4 Step 5
Teaching aids required	
Infrastructure required	
Student preparation required/ prior reading required	
Assessment method chosen	
Other comments	

Annexure B

Examples of Task Training Modules

Annexure B

Examples of Task Training Modules

Example 1: Module for Recording Blood Pressure

Competency in Phase-I:

PY5.12: Record blood pressure & pulse at rest and in different grades of exercise and postures in a volunteer or simulated environment.

Skill training: Recording of blood pressure.

Objectives:

By the completion of this module, the student will be able to:

- Record blood pressure of volunteer by palpatory and Auscultatory method, with sphygmomanometer in right / left upper limb, step wise in sitting / lying down / standing position at rest.
- Suggested Teaching Learning Method: DOAP sessions

Background Knowledge:

PY5.3 Discuss the events occurring during the cardiac cycle
PY5.7 Describe and discuss hemodynamics of circulatory system
PY5.8 Describe and discuss local and systemic cardiovascular regulatory mechanisms
PY5.9 Describe the factors affecting heart rate, regulation of cardiac output & blood pressure
Knowledge about the equipment = Sphygmomanometer, its parts, appropriate size selection and placement.

Equipment/ Instrument/ Other requirement:

- Sphygmomanometer
- Stethoscope

- Volunteer / mannequin
- Hand-outs / check list
- Bed/Couch

Steps in Blood Pressure Recording:

- Patient counselling and consent. Explain to the patient the need for Blood Pressure recording and the procedure. Assess patient's understanding and answer any questions they may have. Respond to the patient's concerns throughout the procedure.
- Check the sphygmomanometer and stethoscope.
- Ensure the equipment mercury column is at zero mark.
- Ensure appropriate position of the patient (sitting on a chair with back supported, feet on the floor, legs uncrossed or lying supine).
- Record Blood Pressure after 5 mins. of inactivity.
- Expose the arm and support it at the level of the heart.
- Palpate the brachial artery in cubital fossa.
- Choose appropriately sized cuff & position the center of cuff's bladder over the brachial artery.
- Wrap the cuff smoothly and snugly around the arm. Cuff should be wrapped in a circular manner one-inch above the level of elbow.
- Correctly palpate the radial artery of the volunteer / or the mannequin with 3 fingers.
- Close the sphygmomanometer valve and inflate the cuff to determine mm Hg at which arterial pulsation can no longer be felt.
- Slowly deflate the cuff by opening the sphygmomanometer valve and note the point where arterial pulsation can be felt again (this is estimated systolic BP).
- Inflate the cuff again to a level 20 – 30 mm Hg more than estimated systolic BP.

- Place diaphragm head of the stethoscope lightly over the brachial artery.
- Deflate the cuff slowly by opening the sphygmomanometer valve so that the pressure falls at 2–3 mm Hg / second.
- Note the mm of Hg pressure at which arterial pulsation / beats can be heard (this is systolic BP).
- Continue deflation and note the mm of Hg pressure at which the last arterial beat is heard (this is diastolic BP).
- Continue deflation for another 10 – 20 mm of Hg past the last heard beat to ensure that the absence of sound is not due to skipped beat.
- Deflate the cuff rapidly and completely.
- If necessary to re-record, wait at least 2 minutes.
- Document the recording in terms of patient position, arm used, cuff size, blood pressure recording.
- Inform the patient of your findings and conclude.

Skill assessment:

OSCE type stations, where observer can observe and assess communication skill (counseling), psychomotor skill and attitude (respond to the patient's concerns, inform the patient of the findings and conclude). This can be done either with check lists or using global ratings.

Suggested Reading:

Books Recommended (latest edition)

1. AC Guyton – Text book of Medical Physiology

2. WF Ganong – Review of Medical Physiology

Example 2: Module for Prescription writing

Competency in Phase-II:

PH3.1: Write a rational, correct and legible generic prescription for a given condition and communicate the same to the patient.

Vertically integrated with General Medicine.

Related Competency in Phase-III:

IM12.14: Write and communicate to the patient appropriately a prescription for thyroxine based on age, sex, and clinical and biochemical status.

Vertically integrated with Pharmacology.

Skill training: Write a prescription taking into consideration appropriate drug/s, appropriate doses, contraindications, drug-drug interactions, side effects and cost.

Objectives:

By the completion of this module, the student will be able to:

- Establish therapeutic goal/s, based on a diagnosis,
- Choose the medicine/s,
- Choose the dose, route and frequency,
- Choose the duration of therapy,
- Write the prescription,
- Inform the patient,
- Monitor drug effects and compliance,
- Review/alter prescription in the light of further investigation.

Suggested Teaching Learning Method: Skill station using case-based scenarios; communication skills can be taught using role play or videos for cases in Indian context.

Background knowledge

Prescribing constitutes a significant component of the job, especially for newly qualified IMG. Prescribing involves a complex chain of competencies (as mentioned above),

each of which demands a combination of knowledge and skill. It also represents the most challenging task for which they have to be prepared. Moreover, the clinical situation in which an IMG has to make a prescription is eternally challenging as more and more medicines with complex pharmacology are available or withdrawn, patient population becoming older and more vulnerable, chances of litigation and a greater need for considering cost-effectiveness as well as the use of generics.

Steps of good prescribing:

The following steps are essential before a prescription is made:

- To have clarity about the reasons for prescribing,
- To obtain patient's medication history (including drugs of alternative systems of Medicine),
- To consider other factors that might alter the benefits and harms of treatment,
- To consider the patient's financial status and expectations (generic prescription),
- To know about efficacy, safety and cost-effectiveness of medicines,
- To know National Guidelines on use of drugs, National List of Essential Medicines (NLEM) and local formularies,
- To be clear about the legality of prescriptions involving narcotics etc. using the correct documentation,
- To monitor the outcome of treatment, both beneficial and adverse,
- To communicate and document prescribing decisions, reasons for them and importance of medication adherence.
- To work within the limitations of one's knowledge, skills, and experience.

Skill assessment: In phase II, this skill requires certification and the required number is also given. Skill assessment using OSCE, log books or portfolios is recommended.

Suggested Reading:

Books Recommended (latest edition)

1. Goodman & Gilman's The Pharmacological Basis of Therapeutics, ed. Laurence Brunton, Bruce A. Chabner, BjornKnollman.
2. Essentials of Medical Pharmacology, by KD Tripathi
3. Davidson’s Principles and Practice of Medicine
4. Kumar & Clark: Book of Clinical Medicine

Example 3: Module for Pediatric Intravenous Cannulation

Competency in Phase-III:

PE 15.6: Demonstrate the steps of inserting an IV cannula in a model

Background Information

PE 15.1: Discuss the fluid and electrolyte requirement in health and disease

PE 15.2: Discuss the clinical features and complications of fluid and electrolyte imbalance and outline the management

PE 15.3: Calculate the fluid and electrolyte requirement in health

PE 15.4: Interpret electrolyte report

PE 15.5: Calculate fluid and electrolyte imbalance

PE 24.10: Assess for signs of dehydration, document and present

PE 24.14: Plan fluid management as per WHO criteria

PE 27.5: Describe the etio-pathogenesis, clinical approach and management of shock in children

PE 27.19: Check for signs of shock i.e. pulse, Blood Pressure, CRT

PE 27.21: Choose the type of fluid and calculate the fluid requirement in shock

PE 27.23: Assess for signs of severe dehydration

Introduction

Intravenous access is used when therapies cannot be used or are less effective by alternative routes. Peripheral access is safer, easier to obtain, and less painful than central access. An IMG is required to independently perform pediatric IV cannulation, before being certified.

Suggested Teaching Learning method: Mannequin in a Skills lab

Pre-requisites

Knowledge of superficial veins on the limbs,

Knowledge of indications/ contraindications of IV access,

At least 5 successful supervised practice sessions on arm of rubber mannequin. Should have independently performed at least 02 insertions on an adult patient.

Indications

Replacement of fluids and electrolytes

Blood transfusion

Administration of IV medications

Collection of blood samples

Contraindications

Anatomic disparities

Massive edema

Burns

Cellulitis

Injuries at or proximal to insertion site.

Equipments required:

Gloves, which fit comfortably but are tight, especially at finger tips,

Skin disinfectant (Alcohol Swabs),

22-26 gauge IV catheter / butterfly needle,

Adhesive tape,

Syringe (2to 10 cc, depending on the age of the child),

Normal saline

Sample collection bottles

Infusion set, elastic tourniquet

Clinical waste dustbin.

Steps in Pediatric intravenous cannulation

Preparation

- Explain the procedure to the child and the family without using technical jargon. Tell about the indication for cannulation.

- Obtain informed or implied consent, following procedure discussion, risks, and benefits. Consider the age and competence of the child for consent or assent to the procedure.
- Select the vein to be cannulated. The vein should be wide, straight, palpable, non-tortuous and non-sclerosed. Avoid veins close to the joints or bony prominences. Avoid using dominant hand or paralyzed limb.
- Always apply universal precautions.
- Both visualize and palpate the vein to be cannulated. There is a slight ‘give’ over the vessel compared to other tissues.
- Disinfect overlying skin.
- Use appropriate procedures (toys, music, stories etc.) to distract the child during procedure. For a very irritable child, use of oral sedatives may be considered in consultation with the consultant I/C.
- Avoid using the bed for performing the procedure. A procedure room is better. The room should be adequately lighted and have provision for a spot light.
- Select the correct type and size of the cannula, depending on the indication for cannulation. Should be able to identify the size of the cannula by its color coding.
- Have all the equipments on an autoclaved tray.

Procedure

- Seek the assistance of a colleague or a nurse to hold the child’s limb.
- Position yourself comfortably. Wear the appropriate size gloves using all antiseptic precautions.
- Apply a tourniquet 2-3inches above the intended site. Check for signs of arterial occlusion like blanching or absence of pulse.
- Instruct the child to clench the fist which will improve venous filling.
- Disinfect the site with appropriate antiseptic swab and allow it to dry naturally.

- Take out the cannula and hold it firmly, bevel side up. Look for any signs of breakage.
- Stabilize the vein by stretching the skin over it.
- Using a ‘no-touch’ technique, insert the cannula distal to and along the line of the vein keeping it 10-45 degrees to the skin. This will prevent the cannula piercing the opposite wall.

  After insertion, check flashback of blood into hub. If blood is seen, advance cannula slightly further without stylet and stabilize. Apply pressure to tip of cannula to stabilize it and remove stylet.
- Release the tourniquet.
- Flush the cannula with normal saline to see the free flow.
- Once in place, lower the cannula so that it is now resting on the skin. Request your colleague to help with securing the cannula using a hypo-allergenic tape. Avoid elastic tapes.
- Connect a 3 way connector/ IV set depending on the indication.
- Start the flow of fluid. Watch for any extravasation of fluid. If it happens, stop the flow. Re-attempt the cannulation at a site proximal to the previous one. Do not make more than 02 attempts. Request a senior colleague if you are not successful even after 02 attempts.
- Apply a clean splint to stabilize the limb. Dress with a sterile dressing.
- Fingers/toes should not be covered and remain visible.
- Write the date and time of insertion on a sticker and place over the dressing.

Complications

- Thrombosis
- Hemorrhage
- Phlebitis
- Local site infection

- Extravasation of fluids/medications
- Counter puncture of the vessel wall
- Gangrene of fingers/toes

Assessment:

The procedure is to be assessed by a faculty member using DOPS format and feedback provided.

Suggested Reading:

Books Recommended (latest edition)

1. PG Textbook of Pediatrics, IAP P Gupta et al (Editors)

2. Clinical Methods in Pediatrics, P Gupta

4. Davidson’s Principles and Practice of Medicine

5. Kumar & Clark: Book of Clinical Medicine

Example 4: TRAINING MODULE FOR URINARY BLADDER CATHETERISATION (Male & Female)

Competency in Phase III Part 1 and 2

1. **Competency No:**

OG35.17	Demonstrate the correct technique of urinary catheterisation in a simulated/ supervised environment	S	SH
SU29.7	Describe the principles of management of acute and chronic retention of urine.	K	KH
OR13.2	Participate as a member in team for resuscitation of Polytrauma victim by doing all of the following : (a) I.V. access central - peripheral (b) Bladder catheterization (c) Endotracheal intubation (d) Splintage	S/A	KH / SH

2. **Objectives:**

By the completion of this module, the student will be able to:

a. List the indications for urinary catheterisation (K)
b. Select the equipment for female/male urinary catheterization and choose appropriate catheter type/size (SH)
c. Enumerate the risks associated with catheterization (K)
d. Communicate to the patient about the procedure and care of catheter, including the need for aseptic care (SH)
e. Demonstrate correct method of urinary catheterization with strict aseptic technique in mannequin as well as in patients (male & female) (SH).

3. Background Knowledge:

AN52.2	Describe & identify the micro-anatomical features of: Urinary system: Kidney, Ureter & Urinary bladder Male Reproductive System Testis, Epididymis, Vas deferens, Prostate & penis Female Reproductive system Ovary, Uterus, Uterine tube, Cervix, Placenta & Umbilical cord	K/S	SH
AN48.6	Describe neurological basis of Automatic bladder	K	KH
PY7.6	Describe the innervations of urinary bladder, physiology of micturition and its abnormalities	K	KH
IM18.8	Describe and distinguish based on the clinical presentation, the types of bladder dysfunction seen in CNS disease	K	KH
SU29.7	Describe the principles of management of acute and chronic retention of urine.	K	SH
SU29.9	Describe the clinical features, investigations and principles of management of disorders of prostate.	K	KH
SU29.11	Describe clinical features, investigations and management of Urethral strictures	K	KH
PM7.6	Enumerate the indications and describe the pharmacology and side effects of commonly used drugs in neuropathic bladder	K	KH

4. Setting/Equipment/ Instrument/ other requirements:

Catheterization tray consists of disposable sterile gloves, one fenestrated drape, lubricant, cotton balls with container, artery forceps (2), prefilled 10cc syringe with sterile water to inflate the balloon, sterile specimen container for urine sample collection; sterile catheter, latex (rubber) or silicone: 2 way or 3 way (where possible, select the non-latex

catheter), chlorhexidine 2% aqueous solution, Sterile water, catheter-secure device or adhesive tape, urinary drainage bag.

Choosing the appropriate catheter depends on

i. The size of the patient's urethral canal

ii. The expected duration of catheterization (e.g. intermittent or indwelling)

iii. Knowledge of any allergies to latex or plastic and cleansing solutions

Catheter diameters: 5Fr, 6Fr, 8Fr 10Fr, 12Fr, 14Fr, 16Fr, 18Fr, 20Fr, 22Fr, 24Fr, 26Fr.

Commonly used range is from 12 to 16 Fr

The higher the number the larger the diameter of the catheter.

3Fr. = 1mm (i.e. a 24fr. catheter is 8mm in diameter)

5. Procedure Steps: (can be used to prepare check list)

Communication:

Prior to starting, explain to the patient about the need and process of urinary catheterization. Assess patient's understanding and answer any questions they may have. Check consent for procedure. Explain about the care of catheter after insertion also.

Steps in female catheterization

- Place the patient in the supine position with the knees flexed and separated and feet flat on the bed, about 60 cm apart. If this position is uncomfortable, instruct the patient either to flex only one knee and keep the other leg flat on the bed, or to spread her legs as far apart as possible. A lateral position may also be used for elderly or disabled patients. Drape the patient appropriately using the sterile drapes provided.

- With the thumb, middle and index fingers of the non-dominant hand, separate the labia majora and labia minora. Pull slightly upward to locate the urinary meatus. Maintain this position to avoid contamination during the procedure.
- With your dominant hand, cleanse the urinary meatus, using forceps and chlorhexidine soaked cotton balls. Use each cotton ball for a single downward stroke only.
- Place the drainage basin containing the catheter between the patient's thighs.
- Pick up the catheter with your dominant hand.
- Insert the lubricated tip of the catheter into the urinary meatus.
- Advance the catheter about 5-5.75 cm, until urine begins to flow, then advance the catheter a further 1-2 cm.
- **Note:** If the catheter slips into the vagina, leave it there to assist as a landmark. With another lubricated sterile catheter, insert into the urinary meatus until you get urine back. Remove the catheter left in the vagina at this time.
- Attach the syringe with the sterile water and inflate the balloon. It is recommended to inflate the 5cc balloon with 7-10cc of sterile water, and to inflate the 30cc balloon with 30-35cc of sterile water.
- If resistance is met during advancement of the catheter, pause for 10-20 seconds. Instruct the patient to breathe deeply and evenly. Apply gentle pressure as the patient exhales.
- Improperly inflated balloons can cause drainage and leakage difficulties.
- Gently pull back on the catheter until the balloon engages the bladder neck.
- Attach the urinary drainage bag and position it below the bladder level. Secure the catheter to the thigh. Avoid applying tension to the catheter.
- Remove drapes and cover patient. Ensure drainage bag is attached to bed frame. Remove your gloves and wash hands.

Steps in male catheterization

- Place the patient in the supine position with legs extended and flat on the bed.
- Prepare the catheterization tray and catheter and drape the patient appropriately using the sterile drapes provided. Place the fenestrated (drape with hole) drape over the penis.
- Apply water-soluble lubricant to the catheter tip.
- With your non-dominant hand, grasp the penis just below the glans and hold upright.
- If the patient is uncircumcised, retract the foreskin. Replace the foreskin at the end of the procedure.
- With your dominant hand, cleanse the glans using chlorhexidine soaked cotton balls. Use each cotton ball for a single circular motion.
- Place the drainage basin containing the catheter on or next to the thighs.
- With your non-dominant hand, gently straighten and stretch the penis. Lift it to an angle of 60-90 degrees. At this time, you may use the gel to anesthetize the urinary canal, which will minimize the discomfort.
- With your dominant hand, insert the lubricated tip of the catheter into the urinary meatus.
- Continue to advance the catheter completely to the bifurcation i.e. until only the inflation and drainage ports are exposed and urine flows (this is to ensure proper placement of the catheter in the bladder and prevent urethral injuries and hematuria that result when the Foley catheter balloon is inflated in the urethra).
- **Note:** If resistance is met during advancement of the catheter, pause for 10-20 seconds. Instruct the patient to breathe deeply and evenly. Apply gentle pressure as the patient exhales.
- If you still meet resistance, stop the procedure and repeat above steps with a smaller size.

- Attach the syringe with the sterile water and inflate the balloon. It is recommended to inflate the 5cc balloon with 7-10cc of sterile water, and to inflate the 30cc balloon with 35cc of sterile water. Improperly inflated balloons can cause drainage and leakage difficulties.
- Gently pull back on the catheter until the balloon engages the bladder neck.
- Attach the urinary drainage bag and position it below the bladder level. Secure the catheter to the thigh. Avoid applying tension to the catheter.
- Remove drapes and cover patient. Ensure drainage bag is attached to bed frame. Remove your gloves and wash hands.
- **Note:** Never inflate a balloon before establishing that the catheter is in the bladder and not just in the urethra. If the patient reports discomfort, withdraw the fluid from the balloon and advance the catheter a little further, then re-inflate the balloon.

Risks associated with catheterization include:

a. Urethral trauma and bleeding from inappropriate catheter size or use of force.

b. Urinary tract infections related to poor sterile technique or long-term catheterization.

c. Bladder spasms and pain.

Skill assessment:

i. **Formative:** Demonstration of successful urinary bladder catheterization in a mannequin with demonstration of all aseptic precautions (5 times).

ii. **Summative:** Demonstration of successful urinary bladder catheterization in male and female patients with demonstration of all aseptic precautions (5 times each) during internship.

Example 5: Module for Consent taking and documentation

Competency in Phase-III:

Relevant Competencies:

FM 4.19	Define Consent. Describe different types of consent and ingredients of informed consent. Describe the rules of consent and importance of consent in relation to age, emergency situation, mental illness and alcohol intoxication.	K	KH

SU 10.2	Describe the steps and obtain informed consent in a simulated environment	S/A/ C	SH

IM26.15	Identify, discuss and defend, medico-legal, socio-cultural and ethical issues as they pertain to consent for surgical procedures	K	KH

EN 2.12	Counsel and administer informed consent to patients and their families in a simulated environment	S/A/C	SH

Prior competencies

FM2.32	Demonstrate ability to exchange information by verbal, or nonverbal communication to the peers, family members, law enforcing agency and judiciary	A and C	KH

IM26.35	Demonstrate empathy in patient encounters	S	SH

SU8.2	Demonstrate Professionalism and empathy to the patient undergoing General surgery	A/C	SH

PS1.1	Establish rapport and empathy with patients	A/C	SH

Skill training: Counsel and administer informed consent prior to lumbar puncture to a patient and family in a simulated environment.

Objectives:

By the completion of this module, the student will be able to:

i. Demonstrate good communication skills and empathy,

ii. Counsel a patient regarding the purpose, steps and complications related to lumbar puncture,

iii. Obtain informed consent,

iv. Document the informed consent as per legal requirements.

Suggested Teaching Learning Methods:

- Lecture regarding the definition, importance, legal aspects of the consent taking process;
- Skill station using case based scenarios;
- Communication skills taught using role play or videos for cases in Indian context; documentation using structured exercises and critics.

Background knowledge

The IMG should be aware of the need and advantages, steps to perform, and consequences of lumbar puncture in a patient suspected to have meningitis or similar illnesses. She / He should know about the rights of the patient to be informed about (a) the procedure, (b) alternatives to the procedure, and (c) right for refusal (autonomy) without treatment being affected. The importance of proper documentation of the informed consent should be emphasized. The communication skills, attitude, ethics and knowledge domains should also be discussed.

Steps for consent taking:

The following steps are essential:

- The student should have completed communication skills training and counselling exercises and must be capable of demonstrating empathy.

- The students should have thorough knowledge of the indications, anatomical and physiologic basis and the consequences of the procedure to be followed.
- The student shall discuss the above information in a language that is understandable to the patient (simulated in skill lab). The student should consider the patient's educational status and expectations and be open to questioning.
- The student shall emphasize the advantages of the procedure to convince the patient and family, but should also make them understand of their right to refusal, without the treatment being affected.
- The student shall describe about the legality of informed consent.
- Perform the correct documentation including writing the consent by hand in vernacular with signatures of patient, legally authorized representative or parent (as the case may be) and countersigned by the witness and the clinician with date, time etc..
- The training can also include critics of few consent documents from various situations and departments (like General Medicine, General Surgery, Pediatrics, Obstetrics & Gynaecology, Radiodiagnosis, Oncology etc.)
- The student can also be introduced to consent taking in relation to recruitment of subjects in research as well (Competency No. IM 26.49 administer informed consent and appropriately address patient queries to a patient being enrolled in a research protocol in a simulated environment)

Skill assessment: This skill requires certification. Skill assessment is recommended using affective OSCE (using simulated patients), written exercises, logbooks or portfolios.

Example 6: Module for Suturing a wound– simple sutures

Relevant competencies:

- SU14.3 Describe the materials and methods used for surgical wound closure and anastomosis (sutures, knots and needles).
- SU14.4 Demonstrate the techniques of asepsis and suturing in a simulated environment
- Regulations on Graduate Medical Education, Part II, 2019 - Table 11:

  Certifiable Procedural Skills: General Surgery: **Basic suturing**

Objectives:

By the completion of this module, the student will be able to suture a wound by simple suture in a simulated environment.

- Suggested Teaching Learning Method: DOAP sessions

Background Knowledge:

SU5.1 Describe normal wound healing and factors affecting healing.
SU5.2 Elicit, document and present a history in a patient presenting with wounds.
SU5.3 Differentiate the various types of wounds, plan and observe management of wounds.
SU5.4 Discuss medico-legal aspects of wounds.

Knowledge about different suture materials, advantages, disadvantages, selection of appropriate suture material.
Wound cleaning and administration of local anesthesia.

Equipment / Instruments / other requirements:

Suturing task training models / part mannequins.

Appropriate Suture material like 2-zero nylon/silk with atraumatic reverse cutting needle. Suturing Instruments – Thumb forceps, Needle holder and scissors.

	Steps for simple suturing - can be used as check list	Performed Correct = ✓ Not correct= X	Remarks
1	Explain to patient or relatives regarding need of procedure and record informed consent.		
2	Clean the wound and surroundings with appropriate antiseptic solution and maintain asepsis during procedure. Wear well-fitting surgical glove.		
3	Local or general anaesthesia is given / tested/ confirmed		
4	Hold the toothed forceps with non-dominant hand to grasp the skin edges. If necessary, debride edge		
5	Hold a needle holder in dominant hand by partially inserting the thumb and ring fingers into the loops of the handle		
6	Needle grasped at its centre or 50 – 60 % back from pointed end.		
7	The needle grasped 1-2 mm from the tip of needle holder.		
8	Placement of the 1st suture is begun by grasping the skin edge, slightly everting and needle entering perpendicular from outside-in 1.5 cm from the edge of the wound.		
9	The needle is re-grasped with forceps after being driven through the full thickness of the skin from outside in.		
10	Same technique is followed on the other skin edge exactly opposite to the previous bite from inside out.		
11	The suture material is drawn through the skin leaving 2-3 cm protruding from the skin surface.		
12	The long strand is wrapped around needle holder to form loop for throw.		
13	The short strand is grasped and pulled through the loop to form a square knot, just tight enough to approximate the wound edges.		
14	The second throw of the square knot is initiated with the long strand warped around the needle holder.		
15	Hold the short end with the needle holder and pull the strand out to make a knot and tightened securely over the first knot.		
16	The suture material is cut with scissor 1 – 2 cm away from the knot.		
17	The procedure is repeated 1.5 cm away.		
18	Wound is cleaned, local antibiotic ointment/ cream is applied and proper dressing is given.		
19	Patient is explained about postoperative care.		

Skill assessment:

OSCE type stations, where observer or their group members can observe with a check list.

Note: Apart from the Psychomotor skill, the module can be further expanded to include communication skill (counseling, obtaining consent) and attitude (respond to the patient's concerns, inform the patient of your findings and conclude). This can be done either with check lists or by using global ratings.

Annexure C

Guidelines for development of skills lab at medical colleges

Annexure C

6.1 Guidelines for development of skills lab at medical colleges:

1. Every medical institution must provide students access to a skills laboratory where they can practice and improve skills pre-specified in the curriculum.
2. The purpose of the skills lab is to provide a safe and non-threatening environment for students to learn, practice and be observed performing skills in a simulated environment thus mitigating the risks involved in direct patient exposure without adequate preparation and supervision.
3. The skills lab attempts to recreate the clinical environment and tasks which future health care workers have to perform with various levels of complexity and fidelity.
4. Skills labs are used to enhance - clinical, psychomotor and communication skills - as well as teamwork.
5. The skills lab that fulfills the requirements of the outcomes in undergraduate curriculum should contain, at the minimum, the following:

    a. The skills lab should have a total area of at least 2000 sqft for 100 students, there must be a facility for minimum of 04 rooms (preferably 08) for examination of patients or standardized/ simulated patients.

    b. The skills lab should be equipped with a facility for video recording and review of the interaction. This is vital for teaching communication skills.

    c. A room for demonstration of skills to small groups,

    d. A review or debriefing area,

    e. Stations for practicing skills individually or in groups,

    f. Trainers or mannequins required to achieve skills outlined in the competency based undergraduate curriculum document,

    g. Adequate storage space for storage of mannequins and/or other equipments,

h. A room for faculty coordinator, and for support staff.

i. Dedicated technical officer and support staff must be available.

6.2 Suggested facilities in Skill Labs (for 100 students) by the start of Phase 1 in all medical colleges

Part Time task trainer simulators / models / mannequins for:

- First aid, Bandaging, splinting; n=4
- Basic Life Support (BLS), CPR (Cardio Pulmonary Resuscitation) mannequin: n=4
- Various types of injections- Subcutaneous, Intra-muscular, Intra-venous; n=5
- Urine Catheter insertion; n =4
- Skin & Fascia suturing n=5
- Breast examination model /mannequin
- Gynecological examination model / mannequin including IUCD (Intra Uterine Contraceptive Device) Training model
- Obstetrics mannequins including Obstetric examination, conduct and management of vaginal delivery.
- Neonatal & Pediatric resuscitation mannequins
- Whole body mannequins, Trauma mannequin (Optional)

Each model (Low or High Fidelity) should have a module for training including objectives, methods and assessment. Modules can also have hybrid models where real patients or standardized/simulated patients/ computer simulations can be used.

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EXTRAORDINARY

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PART III—Section 4

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राष्ट्रीय आयुर्विज्ञान आयोग

अधिसूचना

नई दिल्ली, 29 दिसंबर, 2023

फ़ा. सं. सीडीएन-19012/5/2023-समन्वय-एनएमसी.—राष्ट्रीय आयुर्विज्ञान आयोग अधिनियम, 2019 द्वारा सामान्य और विशेष रूप से चिकित्सा शिक्षा की धारा 25 की उप-धारा (1) और उक्त अधिनियम की धारा 57 की उप-धारा (2) और धारा 35 द्वारा प्रदत्त समग्र शक्तियों का प्रयोग करते हुए, राष्ट्रीय आयुर्विज्ञान आयोग निम्नलिखित विनियम बनाता है, अर्थात्-

संक्षिप्त शीर्षक - इन विनियमों को संक्षिप्त रूप में "स्नातकोत्तर चिकित्सा शिक्षा विनियम-2023" या "पीजीएमईआर-23" कहा जाएगा।

प्रारंभ - ये विनियम आधिकारिक राजपत्र में उनके प्रकाशन की तारीख से प्रवृत होंगे। बशर्ते राष्ट्रीय चिकित्सा आयोग यहां बताए गए विभिन्न नियमों के लिए अलग-अलग तारीखें प्रकाशित कर सकता है।

अध्याय 1

प्रारंभिक

1.1 फोकस और लक्ष्य - स्नातकोत्तर चिकित्सा शिक्षा का लक्ष्य स्नातक विद्वान के रूप में मान्यता प्राप्त सक्षम विशेषज्ञ और चिकित्सा शिक्षकों को तैयार करना होगा, अपनी स्नातक शिक्षा और कौशल का निर्माण जो करेंगे -

i. समुदाय की स्वास्थ्य आवश्यकताओं को पहचान सके और राष्ट्रीय स्वास्थ्य नीति के उद्देश्यों को ध्यान में रखते हुए नैतिक रूप से पेशेवर दायित्वों को पूरा कर सके;

ii. संबंधित विशिष्टताओं जो स्वाथ्य देखभाल वितरण प्रणाली के द्वितीयक और तृतीयक स्तरों पर अभ्यास करने के लिए आवश्यक है, में अधिकतर क्षमताओं में प्रवीणता हासिल कर ली है;

iii. संबंधित विषय में समसामयिक प्रगति और विकास के बारे से अवगत रहें और तदनुसार प्रगति करेंगे;

iv वैज्ञानिक अन्वेषण की भावना हासिल कर ली है और अनुसंधान पद्धति और महामारी विज्ञान के सिद्धांतों को आगे बढ़ाने के प्रति उन्मुख है;

v. चिकित्सा और पैरामेडिकल पेशेवरों के शिक्षण के मामले में मूलभूत कौशल हासिल कर लिया है;

vi. स्वास्थ्य देखभाल वितरण, सामान्य अस्पताल प्रबंधन, प्रमुख मद की सूची में कौशल और परामर्श से संबंधित मानव संसाधन, सामग्री और संसाधन प्रबंधन में मूलभूत प्रबंधन कौशल हासिल कर लिया गया है;

vii. पेशेवर जीवन के लिए आवश्यक व्यक्तिगत विशेषताओं और दृष्टिकोणों का विकास करना जैसे व्यक्तिगत ईमानदारी, जिम्मेदारी और निर्भरता की भावना और अन्य व्यक्तियों के साथ जुड़ने या उनके लिए चिंता महसूस करने की क्षमता;

viii. पेशेवर नैतिकता के उच्चतम मानकों का पालन करके और राष्ट्रीय आकांक्षाओं को पूरा करने के लिए सामाजिक और व्यावसायिक दायित्वों को पूरा करने की दिशा में काम करके एक अनुकरणीय नागरिक बनें।

स्नातकोत्तर चिकित्सा शिक्षा प्रदान करने वाले संस्थानों को उच्च स्तरीय ज्ञान एवं उचित कौशल रखने वाले और त्रुटिहीन नैतिक मानकों के साथ प्रशिक्षित श्रमशक्ति तैयार करने के लिए संस्थागत लक्ष्यों को राष्ट्रीय लक्ष्यों के साथ समन्वित करने के लिए लगातार काम करना होगा ।

1.2 परिभाषा इन विनियमों में, जब तक कि संदर्भ में अन्यथा आवश्यक न हो, यहां परिभाषित शब्दों का वही अर्थ होगा जो उन्हें नीचे दिया गया है और उनकी सजातीय अभिव्यक्तियां और विविधताएं तदनुसार समझी जाएंगी -

क. **"अधिनियम"** से राष्ट्रीय आयुर्विज्ञान आयोग अधिनियम, 2019 [2019 का अधिनियम संख्या 30] अभिप्रेत होगा।

ख. **"आयोग"** से राष्ट्रीय आयुर्विज्ञान आयोग अधिनियम, 2019 की धारा 3 के अधीन विधिवत स्थापित राष्ट्रीय आयुर्विज्ञान आयोग अभिप्रेत होगा।

ग. **"'चिकित्सा संस्थान"** से राष्ट्रीय आयुर्विज्ञान आयोग अधिनियम, 2019 की धारा 2(i) में परिभाषित 'चिकित्सा संस्थान' अभिप्रेत होगा; और इसमें इसकी सामान्य अभिव्यक्ति चिकित्सा महाविद्यालय भी शामिल होगा।

घ. **"पीजीएमईबी"** से राष्ट्रीय आयुर्विज्ञान आयोग अधिनियम, 2019 की धारा -16 के तहत विधिवत गठित स्नातक चिकित्सा शिक्षा बोर्ड अभिप्रेत होगा।

ङ. **"यूजीएमईबी"** से राष्ट्रीय आयुर्विज्ञान आयोग अधिनियम, 2019 की धारा -16 के तहत विधिवत गठित स्नातकोत्तर चिकित्सा शिक्षा बोर्ड अभिप्रेत होगा।

च. **"एमएसआर"** "एमएसआर" से अभिप्राय यूजीएमईबी या पीजीएमईबी जैसा भी मामला हो, द्वारा समय-समय पर अधिसूचित आवश्यकताओं के न्यूनतम मानक आवश्यकता होंगे, जिसमें संबंधित बोर्ड या आयोग द्वारा जारी व्याख्यात्मक नोट, परिपत्र, सलाह आदि भी शामिल होंगे।

छ. **"नीट"** से 'विस्तृत स्पेशलिटी पाठ्यक्रमों में प्रवेश के लिए राष्ट्रीय पात्रता-सह-प्रवेश परीक्षा' अभिप्रेत होगा।

ज. **"नीट-एसएस"** से राष्ट्रीय आयुर्विज्ञान आयोग अधिनियम, 2019 की धारा 14 के अधीन संदर्भित 'सुपर स्पेशलिटी पाठ्यक्रमों के लिए राष्ट्रीय पात्रता-सह-प्रवेश परीक्षा' अभिप्रेत होगा।

झ. **"नेक्स्ट"** से सामान्य अंतिम वर्ष की परीक्षा या नेशनल एग्जिट टेस्ट अभिप्रेत होगा, जैसा कि राष्ट्रीय आयुर्विज्ञान आयोग अधिनियम, 2019 की धारा 15 के अधीन संदर्भित है।

ञ. **"विश्वविद्यालय"** से धारा 2 की उप-धारा (च) के अधीन परिभाषित स्वास्थ्य विश्वविद्यालय या धारा 2 की उप-धारा (भ), जैसा भी मामला हो, के अधीन परिभाषित विश्वविद्यालय अभिप्रेत होगा जैसा कि राष्ट्रीय आयुर्विज्ञान आयोग अधिनियम, 2019 के अधीन है।

ट. **"फीडर स्पेशलिटी"** से अभिप्राय सुपर स्पेशलिटी पाठ्यक्रम करने के लिए आवश्यक ब्रॉड स्पेशलिटी पाठ्यक्रम होगा।

अध्याय-II

अर्हताओं की सूची और पाठ्यक्रमों की अवधि

2.1 अर्हताओं की सूची, पाठ्यक्रम की अवधि और स्नातकोत्तर प्रशिक्षण के घटक नीचे बताए अनुसार होंगे

क्र. सं.	अर्हताओं का नाम	पाठ्यक्रम की अवधि (परीक्षा की अवधि सहित)
i.	स्नातकोत्तर ब्रॉड स्पेशलिटी पाठ्यक्रम **(अनुलग्नक-1)**	3 वर्ष/2 वर्ष*
ii.	स्नातकोत्तर सुपर स्पेशलिटी पाठ्यक्रम (डीएम/एमसीएच) **(अनुलग्नक-2)**	3 वर्ष
iii.	स्नातकोत्तर डिप्लोमा पाठ्यक्रम **(अनुलग्नक-3)@**	2 वर्ष
iv.	पोस्ट-डॉक्टोरल सर्टिफिकेट पाठ्यक्रम(पीडीसीसी)**(अनुलग्नक-4)**	1 वर्ष
v.	पोस्ट-डॉक्टोरल फ़ेलोशिप (पीडीएफ) पाठ्यक्रम **(अनुलग्नक-5)**	2 वर्ष
vi.	डीएम/एम.सीएच (6 वर्षीय पाठ्यक्रम) (**अनुलग्नक-6**)	6 वर्ष

*परीक्षा की अवधि सहित प्रशिक्षण की अवधि उन छात्रों के लिए दो वर्ष होगी, जिनके पास एक ही विषय में मान्यता प्राप्त दो वर्षीय स्नातकोत्तर डिप्लोमा पाठ्यक्रम है।

@ चिकित्सा महाविद्यालय/संस्थान डिप्लोमा सीटों को डिग्री सीटों में परिवर्तित करने के लिए चिकित्सा मूल्यांकन और रेटिंग बोर्ड (मार्ब) को आवेदन कर सकते हैं। डिप्लोमा सीटों की संख्या शुरू करने या बढ़ाने की अनुमति के लिए अब किसी नए आवेदन पर विचार नहीं किया जाएगा।

अध्याय-III

स्नातकोत्तर चिकित्सा संस्थानों की स्थापना और नए स्नातकोत्तर चिकित्सा पाठ्यक्रम शुरू किया जाना और चिकित्सा शिक्षा के मानक का रखरखाव

3.1 अनुमति और मान्यता-

i. कोई भी चिकित्सा संस्थान कोई भी स्नातकोत्तर पाठ्यक्रम तब तक शुरू नहीं करेगा जब तक कि उसे राष्ट्रीय आयुर्विज्ञान आयोग या राष्ट्रीय आयुर्विज्ञान आयोग के बोर्ड से अनुमति न मिल जाए।

ii. उपरोक्त उपधारा (i) पर प्रतिकूल प्रभाव डाले बिना, स्नातक पाठ्यक्रम चलाने वाले मेडिकल कॉलेज/संस्थान में स्नातकोत्तर पाठ्यक्रम शुरू करने की अनुमति और अनुमति दी जाने वाली सीटों की संख्या का निर्धारण नए चिकित्सा संस्थानों की स्थापना के अनुसार होगा। नए मेडिकल पाठ्यक्रमों की शुरुआत, मौजूदा पाठ्यक्रमों के लिए सीटों में वृद्धि और मूल्यांकन और रेटिंग विनियम, 2023, स्नातकोत्तर चिकित्सा शिक्षा विनियम, 2023, शिक्षक पात्रता और चिकित्सा संस्थान विनियम, 2022, यूजीएमईबी और पीजीएमईबी द्वारा अधिसूचित एमएसआर, संबंधित की पाठ्यक्रम आवश्यकताएं पोस्ट ग्रेजुएट मेडिकल एजुकेशन बोर्ड (पीजीएमईबी) द्वारा समय-समय पर वेबसाइट पर या अन्य तरीकों से अधिसूचित/सूचित की जाने वाली विशेषज्ञता, अन्य प्रासंगिक नियम, व्याख्यात्मक नोट्स, परिपत्र और सलाह आदि समय-समय पर जारी किए जाते हैं।

चिकित्सा महाविद्यालय/संस्थानों को स्नातकोत्तर पाठ्यक्रम शुरू करने की अनुमति दी जाएगी यदि वे मौजूदा स्नातक पाठ्यक्रम चलाने के लिए सभी आवश्यकताओं को पूरा करते हैं। चिकित्सा महाविद्यालय/संस्थान को स्नातक पाठ्यक्रम शुरू करने की अनुमति मिलने के एक साल बाद (अर्थात् स्नातक पाठ्यक्रम के दूसरे वर्ष के दौरान) स्नातकोत्तर पाठ्यक्रम शुरू करने के लिए आवेदन कर सकते हैं।

iii. सरकार के स्वामित्व और प्रबंधन वाले मौजूदा या प्रस्तावित गैर-शिक्षण अस्पताल स्नातक कॉलेज के बिना स्नातकोत्तर पाठ्यक्रम शुरू कर सकते हैं, बशर्ते वे नए चिकित्सा संस्थानों की स्थापना, नए चिकित्सा पाठ्यक्रमों की शुरुआत, मौजूदा के लिए सीटों की वृद्धि में निर्धारित मानदंडों और प्रक्रियाओं को पूरा करते हों। पाठ्यक्रम और मूल्यांकन और रेटिंग विनियम, 2023, स्नातकोत्तर चिकित्सा शिक्षा विनियम, 2023, चिकित्सा संस्थानों में शिक्षक

पात्रता योग्यता विनियम, 2022 पीजीएमईबी द्वारा अधिसूचित एमएसआर (पीजीएमएसआर-23), समय-समय पर अधिसूचित/सूचित संबंधित विशेषज्ञता की पाठ्यक्रम आवश्यकताएँ वेबसाइट पर या स्नातकोत्तर चिकित्सा शिक्षा बोर्ड (पीजीएमईबी) द्वारा अन्य तरीकों से, समय-समय पर जारी किए गए अन्य प्रासंगिक नियम, व्याख्यात्मक नोट, परिपत्र और सलाह आदि।

iv. एक बार अनुमति मिलने पर, अर्हता के लिए पाठ्यक्रम को मान्यता प्राप्त माना जाएगा और अनुमत्य सीटों को प्रदान की गई डिग्री के पंजीकरण के लिए मान्यता प्राप्त सीटों के रूप में माना जाएगा, ऐसे पाठ्यक्रम चलाने वाले चिकित्सा महाविद्यालय/संस्थानों को अर्हता के उक्त पाठ्यक्रम के लिए मान्यता प्राप्त चिकित्सा महाविद्यालय/संस्थानों के रूप में माना जाएगा।

3.2 सीटों की वृद्धि - सीटों की वृद्धि के लिए प्रक्रियाएं, तरीके और मानदंड वही होंगे जो उपरोक्त **उपधारा 3.1** में निर्धारित हैं।

बशर्ते कि पहले से ही मान्यता प्राप्त (प्रत्यायित) स्नातकोत्तर पाठ्यक्रम में दी गई सीटों की वृद्धि को छात्रों के पंजीकरण के उद्देश्य से मान्यता प्राप्त स्नातकोत्तर सीटें माना जाएगा।

3.3 चिकित्सा शिक्षा के मानकों की निगरानी - चिकित्सा शिक्षा के मानकों की निगरानी चिकित्सा शिक्षा मानकों के रखरखाव विनियम, 2023 के अनुसार की जाएगी। चिकित्सा महाविद्यालय/संस्थान को वार्षिक मूल्यांकन के प्रयोजन के लिए राष्ट्रीय आयुर्विज्ञान आयोग द्वारा समय-समय पर जैसा कि निर्धारित किया गया है, वार्षिक शुल्क का भुगतान करना होगा। चिकित्सा महाविद्यालय/संस्थान वार्षिक मूल्यांकन संबद्धता आदि के प्रयोजन के लिए राष्ट्रीय आयुर्विज्ञान आयोग द्वारा समय-समय पर अधिसूचित वार्षिक शुल्क का भुगतान करेगा। पीजीएमईबी नियमित अंतराल पर या क्रमरहित रूप से चिकित्सा महाविद्यालय/संस्थानों का मूल्यांकन भी कर सकता है जैसाकि वह अपनी प्रस्तावों का स्तर को बढ़ाना चाहता है।

3.4 आवश्यकताओं के न्यूनतम मानक (एमएसआर) - चिकित्सा संस्थान स्नातकोत्तर चिकित्सा शिक्षा के लिए एमएसआर दस्तावेज़ में वर्णित भौतिक बुनियादी ढांचे, शिक्षण स्टाफ, नैदानिक सामग्री और अस्पताल से संबंधित शर्तों, जो भौतिक अवसंरचना तक सीमित नहीं है, को पूरा करेगा। इस दस्तावेज़ को पीजीएमएसआर-2023 कहा जाएगा और पीजीएमईबी द्वारा अधिसूचित किया जाएगा। पीजीएमईबी समय-समय पर एमएसआर में संशोधनों को भी अधिसूचित करेगा, जिसका चिकित्सा महाविद्यालय/संस्थानों को अनिवार्य रूप से पालन करना होगा।

अध्याय-IV

प्रवेश, परामर्श, आदि

4.1 **पात्रता मानदंड** – चिकित्सा में स्नातकोत्तर 'ब्रॉड स्पेशलिटी पाठ्यक्रम' करने की पात्रता "एनएमसी, नेशनल एग्जिट टेस्ट रेगुलेशन, 2023" के अनुसार होगी।

बशर्ते कि जब तक नेशनल एग्जिट टेस्ट (एनईएक्सटी) पर आधारित पहला बैच ब्रॉड-स्पेशलिटी पाठ्यक्रमों में प्रवेश के लिए पात्र न हो जाए, स्नातकोत्तर चिकित्सा शिक्षा विनियम, 2000 (पीजीएमईआर-2000) के अनुसार राष्ट्रीय पात्रता-सह-रुचि परीक्षण-स्नातकोत्तर "नीट-पीजी" के माध्यम से प्रवेश की मौजूदा प्रणाली जारी रहेगी।

ऊपर बताई गई किसी भी बात पर प्रतिकूल प्रभाव डाले बिना, स्नातकोत्तर चिकित्सा शिक्षा बोर्ड अधिसूचना के माध्यम से ब्रॉड स्पेशलिटीपाठ्यक्रमों के लिए नीट-पीजी आयोजित करने के तरीके, तौर-तरीके आदि का निर्धारण कर सकता है।

बशर्ते कि मेडिसिन में सुपर स्पेशलिटी कार्यक्रम/पाठ्यक्रम को आगे बढ़ाने की पात्रता जिसे राष्ट्रीय आयुर्विज्ञान आयोग द्वारा संचालित किया गया है या संचालित कराया गया है, राष्ट्रीय पात्रता-सह-प्रवेश परीक्षा-सुपर स्पेशलिटी (नीट-एसएस) में न्यूनतम पात्रता स्कोर हासिल करने पर होगी। मान्यता प्राप्त सुपर-स्पेशलिटी पाठ्यक्रम के सुपर-स्पेशलिटी पाठ्यक्रम को आगे बढ़ाने के लिए आवश्यक फीडर ब्रॉड स्पेशलिटी योग्यता की सूची **अनुबंध-7** के अनुसार है।

नीट-पीजी के लिए एनईएक्सटी में प्राप्त अंकों के आधार पर एक अखिल भारतीय मेरिट सूची के साथ-साथ पात्र उम्मीदवारों की राज्य-वार मेधा सूची तैयार की जाएगी और उम्मीदवारों को केवल उक्त मेधा सूची के लिए स्नातकोत्तर पाठ्यक्रमों में प्रवेश दिया जाएगा।

4.2 **नीट-एसएस का संचालन** – राष्ट्रीय आयुर्विज्ञान आयोग या तो सभी सुपर स्पेशलिटी पाठ्यक्रमों के लिए नीट-एसएस का संचालन कर सकता है या नीट-एसएस आयोजित करने के लिए किसी भी ऐसी एजेंसी या प्राधिकरण को नामित कर सकता है।

बशर्ते राष्ट्रीय आयुर्विज्ञान आयोग नीट-एसएस आयोजित करने के लिए कई एजेंसियों या प्राधिकरणों या एजेंसियों या प्राधिकरणों के संयोजन को नामित कर सकता है, यदि ऐसा पदनाम उद्देश्य के अनुरूप हो।

ऊपर बताई गई किसी भी बात पर प्रतिकूल प्रभाव डाले बिना, स्नाकोत्तर चिकित्सा शिक्षा बोर्ड अधिसूचना के माध्यम से सुपर स्पेशलिटी पाठ्यक्रमों के लिए नीट-एसएस आयोजित करने के तरीके और तौर-तरीकों आदि का निर्धारण करेगा।

4.3 **सामान्य परामर्श** – वर्तमान विनियमों या अन्य एनएमसी विनियमों में कही गई किसी भी बात पर प्रतिकूल प्रभाव डाले बिना, भारत में सभी चिकित्सा संस्थानों के लिए चिकित्सा में स्नातकोत्तर पाठ्यक्रमों में प्रवेश के लिए सामान्य परामर्श केवल संबंधित परीक्षाओं की अर्हता सूची के आधार पर होगा।

बशर्ते सामान्य परामर्श में आवश्यकतानुसार कई दौर हो सकते हैं।

सभी सीटों के लिए सभी राउंड की परामर्श राज्य या केंद्रीय परामर्श प्राधिकरण द्वारा ऑनलाइन मॉडल पर आयोजित की जाएगी और कोई भी चिकित्सा महाविद्यालय/संस्थान किसी भी उम्मीदवार को स्वयं प्रवेश नहीं देगा।

सीट मैट्रिक में विवरण दर्ज करते समय, चिकित्सा महाविद्यालयों को प्रत्येक पाठ्यक्रम के लिए शुल्क की राशि का उल्लेख करना होगा, ऐसा न करने पर सीट की गणना नहीं की जाएगी।

एनएमसी का पीजीएमईबी परीक्षा के संचालन, सामान्य परामर्श, प्रवेश, शामिल होने और शैक्षणिक सत्र शुरू करने के लिए दिशानिर्देश और समय-सारिणी प्रकाशित करेगा; और **धारा 4.4** के अधीन नामित प्राधिकारी ऐसे प्रकाशित दिशानिर्देशों और समय-सारणी के अनुरूप सामान्य परामर्श आयोजित करेगा।

4.4 **सरकार सामान्य परामर्श के लिए एक नामित प्राधिकारी नियुक्त करेगी** – चिकित्सा संस्थानों में चिकित्सा में ब्रॉड स्पेशलिटीवाले स्नातकोत्तर पाठ्यक्रमों में प्रवेश के लिए, केंद्र सरकार या उसके नामित प्राधिकारी अखिल भारतीय कोटा सीटों के लिए परामर्श एजेंसी होगी और संबंधित राज्य सरकार/केंद्र शासित प्रदेश प्रशासन संबंधित राज्य/केंद्र शासित प्रदेश कोटा सीटों के लिए परामर्श एजेंसी होगी। सुपर स्पेशलिटी पाठ्यक्रमों की सभी सीटों के लिए, केंद्र सरकार या उसके नामित प्राधिकारी परामर्श एजेंसी होंगे।

4.5 **परामर्श के अलावा किसी अन्य तरीके से प्रवेश चाहने वाले किसी भी छात्र के लिए निषेध** - कोई भी चिकित्सा संस्थान इन विनियमों के उल्लंघन में किसी भी उम्मीदवार को स्नातकोत्तर चिकित्सा शिक्षा पाठ्यक्रमों (सुपर स्पेशलिटी मेडिकल पाठ्यक्रम) में प्रवेश नहीं देगा।

बशर्ते कि इन विनियमों के उल्लंघन में किसी भी छात्र को प्रवेश देने वाले चिकित्सा संस्थान पर गैर-अनुपालन के लिए प्रति सीट एक करोड़ रुपये का जुर्माना लगाया जाएगा। किसी भी बाद के गैर-अनुपालन या निरंतर उल्लंघन के लिए, चिकित्सा संस्थान को अगले शैक्षणिक वर्ष से न्यूनतम दो शैक्षणिक वर्षों के लिए विषय में किसी भी छात्र को प्रवेश देने से रोक दिया जाएगा।

बशर्ते कि इस अधिदेश के उल्लंघन में प्रवेश पाने वाले ऐसे छात्र को चिकित्सा महाविद्यालय से छुट्टी दे दी जाएगी और एक या अधिक वर्षों के लिए सीटों की दोगुनी संख्या कम कर दी जाएगी।

4.6 **अंतिम सूची प्रस्तुत करना** - संबंधित नामित प्राधिकारी (जिन्होंने सामान्य परामर्श आयोजित की है) सामान्य परामर्श के पूरा होने के एक सप्ताह के भीतर निर्धारित फार्म में छात्रों की अंतिम सूची स्नातकोत्तर चिकित्सा शिक्षा बोर्ड को प्रस्तुत करेंगे, जिसमें उस सूची को एनएमसी वेबसाइट में प्रकाशित किया जाएगा। बशर्ते प्रत्येक संस्थान पीजीएमईबी द्वारा घोषित पाठ्यक्रम में शामिल होने की अंतिम तिथि के एक सप्ताह के भीतर एमएसआर में विस्तृत निर्धारित फार्म में प्रवेशित छात्रों की अंतिम सूची पीजीएमईबी को प्रस्तुत करेगा।

बशर्ते कि केवल उन्हीं चिकित्सा संस्थानों को छात्रों को प्रवेश देने की अनुमति दी गई है, जिन्हें सामान्य परामर्श की अधिसूचना की तारीख से पहले छात्रों को प्रवेश देने की अनुमति थी, और जिन चिकित्सा संस्थानों को सामान्य परामर्श की अधिसूचना की तारीख के बाद अपेक्षित अनुमति मिल गई है, वे अगले शैक्षणिक वर्ष में भाग लेंगे।

स्पष्टीकरण: पहले से स्थापित चिकित्सा संस्थानों में सीटों की संख्या बढ़ाने के लिए अपेक्षित अनुमति भी *यथोचित परिवर्तनों* के साथ लागू होगी।

4.7 **छात्र प्रवासन** - किसी चिकित्सा संस्थान के लिए अंतिम रूप से नामित किसी भी छात्र को, इन विनियमों में उल्लिखित किसी भी बात के बावजूद, किसी अन्य चिकित्सा संस्थान में प्रवास की अनुमति नहीं दी जाएगी।

4.8 **सीटों का आरक्षण** - संबंधित श्रेणियों के लिए चिकित्सा महाविद्यालय/संस्थानों में सीटों का आरक्षण राज्यों/केंद्र शासित प्रदेशों में प्रचलित कानूनों के अनुसार होगा। आगे यह भी उपबंध किया गया है कि 5% सरकारी या सरकारी सहायता प्राप्त उच्च शिक्षण संस्थानों में वार्षिक स्वीकृत प्रवेश क्षमता की सीटें "राष्ट्रीय पात्रता-सह-अर्हता सूची" के आधार पर विकलांग व्यक्तियों के अधिकार अधिनियम, 2016 के प्रावधानों के अनुरूप राष्ट्रीय निकास जाँच परीक्षा या नीट-पीजी के आधार पर बेंचमार्क विकलांगता वाले उम्मीदवारों से भरी जाएंगी। स्नातकोत्तर चिकित्सा पाठ्यक्रमों में प्रवेश के लिए "प्रवेश परीक्षा" के लिए, विकलांग व्यक्तियों के अधिकार अधिनियम,2016 की अनुसूची में निहित "निर्दिष्ट विकलांगता" को **अनुबंध-8** में संलग्न किया गया है और निर्दिष्ट विकलांगता के साथ चिकित्सा में पाठ्यक्रम करने के लिए उम्मीदवारों की पात्रता **अनुबंध-9** के अनुसार होगी। यदि किसी विशेष श्रेणी में विकलांग व्यक्तियों के लिए आरक्षित सीटें उम्मीदवारों की अनुपलब्धता के कारण खाली रह जाती हैं, तो सीटों को संबंधित श्रेणी के लिए वार्षिक स्वीकृत सीटों में शामिल किया जाना चाहिए।

4.9 सुपर स्पेशलिटी पाठ्यक्रमों के लिए फीडर ब्रॉड स्पेशलिटीअर्हताएँ - अर्हता के लिए सुपर स्पेशलिटी पाठ्यक्रम को आगे बढ़ाने के लिए ब्रॉड स्पेशलिटीडिग्री अर्हता की पूर्व आवश्यकता को फीडर पाठ्यक्रमों कहा जाएगा।

अध्याय-V

प्रशिक्षण, आदि

5.1 **प्रशिक्षण की अवधि -** विभिन्न स्नातकोत्तर डिग्री और डिप्लोमा प्रदान करने के लिए प्रशिक्षण की अवधि **अध्याय- II** के अनुसार होगी।

5.2 प्रशिक्षण कार्यक्रम -

(i) स्नातकोत्तर प्रशिक्षण में व्याख्यान, सेमिनार, जर्नल क्लब, समूह चर्चा, प्रयोगशाला और प्रयोगात्मक कार्यों में भागीदारी, अनुसंधान में भागीदारी, नैदानिक बैठकें, भव्य दौर, नैदानिक विकृति विज्ञान सम्मेलन, निदान और चिकित्सा में व्यावहारिक प्रशिक्षण के माध्यम से छात्रों का प्रशिक्षण शामिल होगा। विशेष प्रशिक्षण की आवश्यकता के अनुसार शल्य चिकित्सा अनुरूप उपचार, बुनियादी चिकित्सा विज्ञान के साथ-साथ संबद्ध नैदानिक विशिष्टताओं आदि में प्रशिक्षण दिया जाएगा।

स्पेशलिटी में जहां रोगी का उपचार अंतर्ग्रस्त है, छात्रों के शिक्षण और प्रशिक्षण में रोगियों की देखभाल की जिम्मेदारी प्रबंधन में श्रेणीबद्ध जिम्मेदारी शामिल होगी।

(ii) सभी स्नातकोत्तर छात्र पूर्णकालिक रेजिडेंट डॉक्टर के रूप में काम करेंगे। वे उचित कार्य घंटों के लिए काम करेंगे और उन्हे एक दिन में आराम के लिए उचित समय प्रदान किया जाएगा।

(iii) सभी ब्रॉड स्पेशलिटीऔर सुपर-स्पेशलिटी छात्र थीसिस से संबंधित शोध करेंगे और थीसिस लिखेंगे।

(iv) स्नातकोत्तर प्रशिक्षण कार्यक्रम शुरू करने वाला प्रत्येक संस्थान एक वरिष्ठ संकाय सदस्य की अध्यक्षता में एक अकादमिक सेल स्थापित करेगा, जो प्रत्येक विशेषज्ञता में प्रशिक्षण कार्यक्रमों के कार्यान्वयन का निगरानी करेगा और पीजीएमईबी द्वारा आज्ञापित किए गए गुणवत्ता सुनिश्चित करेगा।

(v) समय-समय पर पीजीएमईबी द्वारा निर्धारित पाठ्यक्रम की आवश्यकता और अन्य प्रासंगिक आवश्यकताओं को ध्यान में रखते हुए प्रशिक्षण कार्यक्रमों को आवश्यकता पड़ने पर अद्यतन किया जाएगा। संरचित प्रशिक्षण कार्यक्रम लिखा जाएगा और उसका सख्ती से पालन किया जाएगा, ताकि परीक्षक उम्मीदवारों द्वारा किए गए प्रशिक्षण का निर्धारण कर सकें।

(vi) ब्रॉड और सुपर स्पेशलिटी डिग्री पाठ्यक्रमों के स्नातकोत्तर छात्रों को एक डायनेमिक-लॉग बुक बनाए रखनी होगी, जिसे उनके द्वारा किए जा रहे कार्यों और प्रशिक्षण की अवधि के दौरान किए गए प्रशिक्षण कार्यक्रम के बारे में साप्ताहिक आधार पर अद्यतन रिपोर्ट तैयार करने की आवश्यकता है। एमएस/एम.सीएच छात्रों को अनिवार्य रूप से सहायता प्राप्त या स्वतंत्र रूप से की गई सर्जिकल प्रक्रियाओं का विवरण दर्ज करना होगा।

(vii) प्रशिक्षण प्रदान करने वाले स्नातकोत्तर गाइड का यह कर्तव्य होगा कि वह मासिक आधार पर रिकॉर्ड (ई-लॉग) पुस्तकों का मूल्यांकन और प्रमाणीकरण करे।

(viii) स्नातकोत्तर छात्रों को स्नातक छात्रों के शिक्षण और प्रशिक्षण कार्यक्रम में अनिवार्य रूप से भाग लेना आवश्यक होगा।

(ix) नैदानिक विषयों में डिग्री/डिप्लोमा के प्रशिक्षण या पुरस्कार के दौरान, संबंधित विषयों से संबंधित बुनियादी चिकित्सा विज्ञान में उचित प्रशिक्षण होगा। प्रशिक्षण कार्यक्रमों के दौरान निवारक और सामाजिक पहलुओं पर जोर देना होगा। सभी स्नातकोत्तर चिकित्सा महाविद्यालय/संस्थान में दिशानिर्देशों के अनुसार बुनियादी विज्ञान विषयों को पढ़ाने की सुविधाएं होंगी।

(x) ब्रॉड स्पेशलिटी/सुपर स्पेशलिटी में डिग्री पाठ्यक्रम के स्नातकोत्तर छात्रों को अपनी अंतिम परीक्षा में उपस्थित होने के योग्य बनाने के लिए निम्नलिखित में से कम से कम एक कार्य करना होगा:

(क) उनकी विशेषज्ञता के राष्ट्रीय/क्षेत्रीय/राज्य सम्मेलन में पोस्टर प्रस्तुति;

(ख) उनकी विशेषज्ञता के राष्ट्रीय/क्षेत्रीय/राज्य सम्मेलन में पोडियम प्रस्तुति;

(ग) पहले लेखक के रूप में अपनी विशेषज्ञता के जर्नल में एक शोधपत्र प्रकाशित/प्रकाशन के लिए स्वीकार किया है।

(xi) अनुसंधान पद्धति में पाठ्यक्रम

(क) सभी स्नातकोत्तर छात्रों को अनुसंधान पद्धति में एक ऑनलाइन पाठ्यक्रम पूरा करना होगा।

(ख) छात्रों को नामित प्रशिक्षण संस्थानों के पोर्टल पर पंजीकरण करना होगा।

(ग) छात्रों को पहले वर्ष में पाठ्यक्रम पूरा करना होगा।

(घ) पाठ्यक्रम के सफल समापन और उसके बाद परीक्षा पर उत्पन्न ऑनलाइन प्रमाणपत्र, इस पाठ्यक्रम को पूरा करने का स्वीकार्य प्रमाण होगा।

(ङ) संबंधित स्नातकोत्तर पाठ्यक्रम की अंतिम परीक्षा में बैठने के लिए पात्र होने के लिए उपर्युक्त प्रमाणीकरण एक अनिवार्य आवश्यकता होगी।

(च) यह आवश्यकता सभी स्नातकोत्तर छात्रों के लिए लागू होगी।

(xii) नैतिकता में पाठ्यक्रम

(क) सभी स्नातकोत्तर छात्रों को संस्थानों/विश्वविद्यालयों द्वारा संचालित अच्छे नैदानिकअभ्यास और अच्छे प्रयोगशाला अभ्यास, जो भी उनके लिए प्रासंगिक हो, सहित नैतिकता में पाठ्यक्रम पूरा करना होगा।

(ख) छात्रों को पहले वर्ष में पाठ्यक्रम पूरा करना होगा।

(ग) किसी भी स्नातकोत्तर छात्र को उपर्युक्त प्रमाणन पूरा किए बिना परीक्षा में बैठने उपर्युक्त की अनुमति नहीं दी जाएगी।

(xiii) हृदय को स्वस्थ रखने में सहायता प्रदान करने का कौशल पाठ्यक्रम

(क) सभी स्नातकोत्तर छात्रों को संस्थान द्वारा संचालित मूलभूत हृदय स्वास्थ सहायता (बेसिक कार्डिएक लाइफ सपोर्ट) और हृदय को स्वस्थ रखनेवाला उन्नत सहायता प्रणाली (कार्डियक लाइफ सपोर्ट) कौशल में एक पाठ्यक्रम पूरा करना होगा।

(ख) छात्रों से अपेक्षा की जाएगी कि वे पहले वर्ष में पाठ्यक्रम पूरा कर लें।

(ग) किसी भी स्नातकोत्तर छात्र को उपर्युक्त प्रमाणीकरण के बिना परीक्षा में बैठने की अनुमति नहीं दी जाएगी।

(xiv) अन्य - संस्थान किसी अन्य पाठ्यक्रम में प्रशिक्षण की व्यवस्था कर सकते हैं जैसे चिकित्सा ऑडिट में जागरूकता; चिकित्सा कानून, मानव व्यवहार के बारे मे जानकारी; वित्तीय लेखा इत्यादि जो स्नातकोत्तर छात्रों के लिए फायदेमंद हैं।

(xv) जिला रेजिडेन्सी कार्यक्रम (डीआरपी)

I. **प्रस्तावना:** चिकित्सकों को विभिन्न पृष्ठभूमि में प्रशिक्षित किया जाना चाहिए, जिसमें समुदाय के करीबी भी शामिल होंगे। इसलिए, उन्हें जिला स्वास्थ्य प्रणाली/जिला चिकित्सालय में प्रशिक्षित किया जाना चाहिए।

बशर्ते कि शैक्षणिक सत्र 2021 से प्रवेशित एम.डी./एम.एस. छात्रों के संबंध में, जिला रेजीडेंसी कार्यक्रम के हिस्से के रूप में दिया गया प्रशिक्षण, को चिकित्सा संस्थान में प्रशिक्षण माना जाएगा।

II. उद्देश्य: जिला रेजीडेंसी कार्यक्रम (डीआरपी) के मुख्य उद्देश्य होंगे:

क. स्नातकोत्तर छात्र को जिला स्वास्थ्य प्रणाली/जिला अस्पताल से परिचित कराना और उन्हें सेवा के दौरान सीखने के लिए जिला स्वास्थ्य प्रणाली/जिला अस्पताल द्वारा प्रदान की जा रही स्वास्थ्य देखभाल सेवाओं में शामिल करना;

ख. उन्हें जिला स्तर पर राष्ट्रीय स्वास्थ्य कार्यक्रमों की योजना, कार्यान्वयन, निगरानी और परिणामों के मूल्यांकन से परिचित कराना; और

ग. राष्ट्रीय स्वास्थ्य मिशन के तहत स्वास्थ्य देखभाल पेशेवरों की विभिन्न श्रेणियों द्वारा प्रदान की जा रही प्रोत्साहन, निवारक, उपचारात्मक और पुनर्वास सेवाओं के लिए उन्हें तैयार करना।

ऐसा करते हुए, स्नातकोत्तर चिकित्सा छात्र भी जिला स्वास्थ्य प्रणाली की सेवाओं को मजबूत करने में योगदान देंगे, विशेष प्रकार के निवासी डॉक्टर जिला टीमों के सदस्यों के रूप में काम करेंगे।

III. **जिला अस्पताल की परिभाषा:** इस कार्यक्रम के प्रयोजन के लिए, एक जिला अस्पताल को उस स्तर/सुविधा पर निर्दिष्ट विशिष्टताओं के लिए सुविधाओं/कर्मचारियों के साथ कम से कम 50 बिस्तरों का कार्यात्मक सार्वजनिक क्षेत्र/सरकार द्वारा वित्त पोषित अस्पताल होना चाहिए। किसी भी स्नातकोत्तर चिकित्सा संस्थान या सुपर-स्पेशलिटी अस्पताल को जिला अस्पताल नहीं माना जाएगा।

IV. **जिला स्वास्थ्य प्रणाली की परिभाषा:** इस कार्यक्रम के उद्देश्य के लिए, जिला स्वास्थ्य प्रणाली में सभी सार्वजनिक क्षेत्र/सरकारी वित्त पोषित अस्पताल और सुविधाएं (सामुदायिक स्वास्थ्य केंद्र, प्राथमिक स्वास्थ्य केंद्र, उप-स्वास्थ्य केंद्र, शहरी स्वास्थ्य केंद्र इत्यादि सहित) के साथ-साथ जिले में सामुदायिक पहुँच प्रणाली भी शामिल होगी। इसमें राष्ट्रीय और राज्य सार्वजनिक स्वास्थ्य कार्यक्रमों के कार्यान्वयन सहित संबंधित सार्वजनिक स्वास्थ्य सेवाओं को चलाने में लगी जिला प्रणाली भी शामिल होगी।

V. **जिला रेजीडेंसी कार्यक्रम:** राष्ट्रीय आयुर्विज्ञान आयोग के दायरे में आने वाले सभी चिकित्सा महाविद्यालय/संस्थानों में ब्रॉड विशिष्टताओं में एमडी/एमएस करने वाले सभी स्नातकोत्तर छात्रों को पाठ्यक्रम के अलावा जिला अस्पतालों/जिला स्वास्थ्य प्रणाली में तीन महीने के अनिवार्य आवासीय रोटेशन से गुजरना होगा। ऐसा रोटेशन स्नातकोत्तर कार्यक्रम के तीसरे या चौथे या पांचवें सेमेस्टर में होगा। उन छात्रों के मामले में जिन्होंने संबंधित विशेषज्ञता में डिप्लोमा पूरा करने के बाद प्रवेश लिया है, जिला रेजीडेंसी कार्यक्रम केवल तीसरे सेमेस्टर में होगा। इसी प्रकार, स्नातकोत्तर डिप्लोमा छात्रों को तीसरे सेमेस्टर में जिला रेजीडेंसी कार्यक्रम में हिस्सा लेना होगा।

इस रोटेशन को 'जिला रेजीडेंसी कार्यक्रम' (डीआरपी) कहा जाएगा और प्रशिक्षण प्राप्त करने वाले स्नातकोत्तर मेडिकल छात्र को 'जिला निवासी' कहा जाएगा।

VI. **जिला रेजीडेंट का प्रशिक्षण और जिम्मेदारियाँ:** जिला रेजीडेंट जिला रेजीडेंसी कार्यक्रम समन्वयक (डीआरपीसी) के सभी निर्देशों और पर्यवेक्षण के तहत काम करेगा।

इस रोटेशन के दौरान, रेजिडेंट डॉक्टर को जिला स्वास्थ्य प्रणाली/जिला अस्पताल में संबंधित/संबद्ध विशेष टीम/यूनिट/अनुभागों/सेवाओं के साथ तैनात किया जाएगा और निवासियों को सौंपी गई नैदानिक जिम्मेदारियों में बाह्य रोगी, आंतरिक रोगी, हताहत और उनकी विशेषज्ञता से संबंधित अन्य क्षेत्रों में सेवा करना और रात की ड्यूटी शामिल होगी।

विशिष्टताओं के स्नातकोत्तर छात्रों को जहां प्रत्यक्ष रोगी की देखभाल शामिल नहीं है, उन्हें जिला स्वास्थ्य अधिकारी/मुख्य चिकित्सा अधिकारी के समन्वय में उपलब्ध अवसर के अनुरूप जिला स्वास्थ्य प्रणाली/जिला अस्पताल टीमों द्वारा प्रशिक्षित किया जाएगा।उन्हें नैदानिक/प्रयोगशाला सेवाओं, फार्मेसी सेवाओं, फोरेंसिक सेवाओं, सामान्य नैदानिक कर्तव्यों, प्रबंधकीय भूमिकाओं, सार्वजनिक स्वास्थ्य कार्यक्रमों आदि में प्रशिक्षित किया जाएगा और उनके द्वारा इन क्षेत्रों में योगदान दिया जाएगा। उन्हें भारतीय चिकित्सा अनुसंधान परिषद और अन्य राष्ट्रीय अनुसंधान संगठनों की अनुसंधान इकाइयों/सुविधाओं, प्रयोगशालाओं और क्षेत्रीय साइटों पर भी तैनात किया जा सकता है।

VII. **जिला रेजीडेंट के लिए वजीफा और छुट्टियाँ:** जिले के निवासी चिकित्सकों, निर्धारित तरीकों और प्रणाली के आधार पर, संबंधित जिला अधिकारियों द्वारा मूल चिकित्सा कॉलेज/संस्थान को प्रस्तुत किए गए उपस्थिति रिकॉर्ड के अधीन, रोटेशन की अवधि के लिए किसी भी चिकित्सा महाविद्यालय से पूर्ण वजीफा प्राप्त करना जारी रखेंगे। कार्य की अत्यावश्यकता के अधीन, जिला रेजीडेंट को रोटेशन के अनुसार एक साप्ताहिक अवकाश की अनुमति दी जाएगी। वे मूल कॉलेज/विश्वविद्यालय के नियमों/दिशानिर्देशों के अनुसार अवकाश लाभ के भी हकदार होंगे।

VIII. डीआरपी के दौरान प्रशिक्षण और उसका प्रमाणीकरण:

क. प्रशिक्षण की गुणवत्ता की निगरानी लॉगबुक, समर्थनकारि पर्यवेक्षण और प्रदर्शन के निरंतर मूल्यांकन द्वारा की जाएगी। जिला निवासी चिकित्सकों की उपस्थिति और प्रदर्शन को संबंधित जिले के जिला रेजीडेंसी कार्यक्रम समन्वयक (डीआरपीसी) के साथ-साथ मूल चिकित्सा कॉलेज द्वारा उचित इलेक्ट्रॉनिक/डिजिटल या मोबाइल सक्षम प्रणाली के माध्यम से ट्रैक किया जाएगा। ऐसी निगरानी प्रणालियाँ राज्य/केंद्र शासित प्रदेश संचालन समिति और राष्ट्रीय समन्वय कक्ष के लिए भी उपलब्ध होंगी।

ख. जिले के निवासी मार्गदर्शन, सीखने और अनुसूचित मामले की चर्चाओं, सेमिनारों, जर्नल क्लबों, थीसिस चर्चा, आदि और अन्य शैक्षणिक गतिविधियाँ में दूर से भाग लेने में सक्षम होने के लिए फोन और ई-संचार के माध्यम से अपने मूल चिकित्सा महाविद्यालय/संस्थान में अपने नामित स्नातकोत्तर शिक्षकों और विभागों के संपर्क में रहेंगे।

ग. उम्मीदवार को संबंधित स्नातकोत्तर पाठ्यक्रम की अंतिम परीक्षा में बैठने की अनुमति देने से पहले जिला रेजीडेंसी का संतोषजनक समापन एक आवश्यक शर्त होगी।

घ. जिला रेजीडेंसी कार्यक्रम समन्वयक (डीआरपीसी) डीआरपी के संतोषजनक समापन का प्रमाण पत्र जारी करेगा और संबंधित चिकित्सा कॉलेज और और पीजीएमईबी द्वारा संबंधित चिकित्सा कॉलेज और राज्य सरकार / केंद्रशासित प्रदेश का तय किए जाने वाले निर्धारित प्रारूप पर जिला निवासी चिकित्सकों के प्रदर्शन के बारे में रिपोर्ट जारी करेगा।

IX. **चिकित्सा महाविद्यालय/चिकित्सा संस्थान की जिम्मेदारी**: सभी चिकित्सा महाविद्यालय/संस्थानों का यह दायित्व होगा कि वे स्नातकोत्तर छात्रों को जिला रेजीडेंसी कार्यक्रम के लिए संबंधित राज्य/केंद्र शासित प्रदेश की सरकार के अधीन रखें। संबंधित विभागों के संकाय **धारा 5.2 VI और VIII** के अनुसार जिला निवासी चिकित्सकों को फोन/ई-संचार द्वारा मार्गदर्शन प्रदान करेंगे।

X. **राष्ट्रीय/राज्य निरीक्षण तंत्र का संविधान**: राज्य सरकार/केंद्र शासित प्रदेश अपने अधिकार क्षेत्र में जिला रेजीडेंसी कार्यक्रम को निम्नानुसार लागू करेंगे:-

क. कार्यक्रम का समन्वय चिकित्सा शिक्षा निदेशालय और स्वास्थ्य सेवा निदेशालय द्वारा संयुक्त रूप से किया जाएगा। राज्य सरकार/केंद्र शासित प्रदेश के एक अधिकारी को राज्य/केंद्र शासित प्रदेश जिला रेजीडेंसी कार्यक्रम (डीआरपी) नोडल अधिकारी के रूप में नामित किया जाएगा। संबंधित सरकार जिला रेजीडेंसी कार्यक्रम की सुविधा, निगरानी और पर्यवेक्षण के लिए जिम्मेदार होगी।

ख. नामित राज्य/यूटीडीआरपी नोडल अधिकारी जिला स्वास्थ्य प्रणाली/जिला अस्पताल की पहचान और नामित करेगा जो विशिष्ट विशिष्टताओं, विशेषज्ञों की उपलब्धता के संदर्भ में ऐसे रोटेशन के लिए उपयुक्त हैं, राज्य के स्वास्थ्य सेवा निदेशालय और चिकित्सा महाविद्यालय के परामर्श से उपलब्ध सुविधाएं और सेवाएँ, और कम से कम 6 महीने पहले रोटेशन के कारण चिकित्सा महाविद्यालय के पोस्ट-ग्रेजुएट रेजिडेंट्स का प्लेसमेंट शेड्यूल विकसित करें। यह अधिकारी राज्य स्तर पर शिकायत निवारण के लिए भी जिम्मेदार होगा।

ग. राज्य डीआरपी नोडल अधिकारी स्नातकोत्तर निवासियों को प्रशिक्षण सुविधाओं का नियम-आधारित आवंटन करेगा।

घ. राज्य सरकार जिला निवासियों को उचित सुविधाएं प्रदान करेगी, जिसमें अन्य बातों के अलावा, उपयुक्त आवास, भोजनालय, कार्यस्थल तक परिवहन (यदि रहने का स्थान दूर है), सुरक्षा, विशेष

रूप से महिला निवासियों के लिए शामिल है। आवास सरकारी परिसर के माध्यम से या संबंधित राज्य सरकार द्वारा किराए पर लिया जा सकता है और निर्धारित मानदंडों के अनुरूप होना चाहिए।

ङ. जिले के रेजीडेंट चिकित्सक संबंधित राज्य/केंद्रशासित प्रदेश डीआरपी नोडल अधिकारी के अधिकार क्षेत्र में रहेंगे जहां वे जिला रेजिडेंसी कार्यक्रम में भागीदारी कर रहे हैं।

च. यदि राज्य/केंद्रशासित प्रदेश के सभी स्नातकोत्तर निवासियों को उनके संबंधित अधिकार क्षेत्र में शामिल नहीं किया जा सकता है, तो उन्हें राष्ट्रीय समन्वय सेल की सहायता से संबंधित सरकारों के परामर्श से आपसी समझ से अन्य राज्यों/केंद्र शासित प्रदेशों में तैनात करने की संभावना तलाशी जा सकती है।

छ. देश के विभिन्न चिकित्सा महाविद्यालय/संस्थानों में उत्तर पूर्व क्षेत्र (एनईजेड) के स्नातकोत्तर छात्रों को अपने संबंधित राज्यों में जिला रेजीडेंसी कार्यक्रम में भागीदारी करने की अनुमति होगी।

ज. राज्य सरकार/केंद्र शासित प्रदेश राज्य की स्वास्थ्य देखभाल सेवाओं में उनके योगदान की मान्यता के प्रतीक के रूप में जिला निवासियों को अतिरिक्त मानदेय प्रदान करने पर विचार कर सकते हैं। इसके अलावा, संबंधित सरकारें दूरदराज और कठिन क्षेत्रों में पोस्टिंग को प्रोत्साहित करने के लिए प्रावधान कर सकती हैं, और स्नातकोत्तर छात्रों को इन स्थानों पर सेवा करने के लिए स्वेच्छा से प्रोत्साहित कर सकती हैं।

झ. संबंधित राज्य सरकार राज्य डीआरपी नोडल अधिकारी और चिकित्सा महाविद्यालय के बीच समन्वय के लिए प्रत्येक जिले में जिला स्वास्थ्य प्रणाली के एक वरिष्ठ अधिकारी को जिला रेजीडेंसी कार्यक्रम समन्वयक (डीआरपीसी) के रूप में भी नामित करेगी। जिला रेजीडेंसी कार्यक्रम समन्वयक स्नातकोत्तर निवासियों को जिला स्वास्थ्य प्रणाली की ओर कार्य करने, जिले के भीतर पोस्टिंग की निगरानी करने, उनके आवास, सुरक्षा और परिवहन आवश्यकताओं को सुनिश्चित करने और शिकायत निवारण आदि के लिए भी जिम्मेदार होगा। जिला रेजीडेंसी कार्यक्रम समन्वयक जिला निवासियों को छुट्टी स्वीकृत करने के लिए सक्षम प्राधिकारी होगा।

XI. **राष्ट्रीय आयुर्विज्ञान आयोग की जिम्मेदारी:** सभी चिकित्सा संस्थान डीआरपी पूरा होने के एक सप्ताह के भीतर छात्रों की डीआरपी पोस्टिंग विवरण राष्ट्रीय आयुर्विज्ञान आयोग के पीजीएमईबी को प्रस्तुत करेंगे। राष्ट्रीय आयुर्विज्ञान आयोग का पीजीएमईबी प्रशिक्षण कार्यक्रम की निगरानी करेगा और यदि चाहे तो राज्य सरकार और चिकित्सा संस्थानों को आवश्यक बदलाव का निर्देश दे सकता है।

XII. राष्ट्रीय/राज्य निरीक्षण तंत्र का गठन: राष्ट्रीय आयुर्विज्ञान आयोग जिला रेजीडेंसी कार्यक्रम के कार्यान्वयन की देखरेख के लिए भारत सरकार के स्वास्थ्य और परिवार कल्याण मंत्रालय के परामर्श से एक राष्ट्रीय संचालन समिति का गठन करेगा।

क. राष्ट्रीय संचालन समिति की अध्यक्षता अध्यक्ष, स्नातकोत्तर चिकित्सा शिक्षा बोर्ड (पीजीएमईबी) या उनके नामित व्यक्ति द्वारा की जाएगी। समिति में स्वास्थ्य और परिवार कल्याण मंत्रालय से नामित सदस्य (निदेशक/उप सचिव के पद से नीचे नहीं), स्वास्थ्य सेवा महानिदेशालय (डीजीएचएस) के नामित सदस्य और कम से कम छह राज्य सरकारों/केंद्र शासित प्रदेशों के प्रतिनिधि शामिल होंगे। समिति केंद्र सरकार को त्रैमासिक रिपोर्ट प्रस्तुत कर सकती है।

ख. राष्ट्रीय संचालन समिति राष्ट्रीय आयुर्विज्ञान आयोग के पीजीएमईबी के तहत एक राष्ट्रीय समन्वय कक्ष (एनसीसी) स्थापित करेगी जो जिला रेजीडेंसी कार्यक्रम के सुचारू और कुशल कार्यान्वयन और राष्ट्रीय स्तर पर शिकायत निवारण के लिए जिम्मेदार होगा।

ग. राज्य/केंद्र शासित प्रदेश की सरकारें प्रमुख सचिव/सचिव (स्वास्थ्य) की अध्यक्षता में एक राज्य/केंद्र शासित प्रदेश स्तरीय संचालन समिति का गठन करेंगी और इसमें प्रमुख सचिव/सचिव (चिकित्सा शिक्षा), स्वास्थ्य सेवाओं के निदेशक, चिकित्सा शिक्षा निदेशक, रजिस्ट्रार शामिल होंगे। स्वास्थ्य विश्वविद्यालय और चिकित्सा महाविद्यालय के डीन जिला रेजीडेंसी कार्यक्रम के कार्यान्वयन की सुविधा प्रदान करेंगे।

XIII. स्नातकोत्तर सीटों की आनुपातिक वृद्धि के लिए आवेदन - जिला रेजीडेंसी कार्यक्रम के लिए स्नातकोत्तर चिकित्सा छात्रों/ रेजिडेंट्स की आउट-पोस्टिंग के कारण अपने शिक्षण अस्पताल/संस्थान में काम के संभावित समझौते की भरपाई के लिए महाविद्यालय/संस्थान एमडी/एमएस सीटों की आनुपातिक वृद्धि के लिए आवेदन कर सकता है। ऐसे आवेदन जिला रेजीडेंसी कार्यक्रम के कार्यान्वयन के एक वर्ष के बाद किये जा सकते हैं।

XIV. जिला रेजीडेंसी कार्यक्रम का शुभारंभ: जिला रेजीडेंसी कार्यक्रम को शैक्षणिक सत्र 2021 में स्नातकोत्तर पाठ्यक्रम में शामिल होने वाले स्नातकोत्तर ब्रॉड स्पेशलिटीबैच के साथ लागू किया जाएगा।

5.3 पाठ्यक्रम - स्नातकोत्तर चिकित्सा शिक्षा बोर्ड एनएमसी वेबसाइट पर समय-समय पर मॉडल पाठ्यक्रम और उसके परिणाम उद्देश्यों को प्रकाशित करेगा, जिसे महाविद्यालय/संस्थानों द्वारा कार्यान्वित किया जाएगा।

5.4 स्नातकोत्तर छात्रों को वजीफा - सभी संस्थानों में स्नातकोत्तर डिग्री/डिप्लोमा/सुपर-स्पेशलिटी पाठ्यक्रम करने वाले स्नातकोत्तर छात्रों को राज्य सरकार के चिकित्सा संस्थानों/केंद्र सरकार के चिकित्सा संस्थानों जो राज्य/केंद्र शासित प्रदेश जहां संस्थान स्थित है, के स्नातकोत्तर छात्रों को दिए जाने वाले वजीफे के बराबर भुगतान किया जाएगा।

5.5 स्नातकोत्तर छात्रों के लिए अवकाश नियम - निम्नलिखित अवकाश नियमों का पालन किया जाएगा:

क. प्रत्येक स्नातकोत्तर छात्र को प्रति वर्ष कम से कम 20 दिन का सवैतनिक अवकाश (आकस्मिक अवकाश) दिया जाएगा।

ख. कार्य की अत्यावश्यकता के अधीन, स्नातकोत्तर छात्रों को एक साप्ताहिक अवकाश की अनुमति दी जाएगी।

ग. महिला स्नातकोत्तर छात्रों को मौजूदा सरकारी नियमों और विनियमों के अनुसार मातृत्व अवकाश की अनुमति दी जाएगी।

घ. पुरुष स्नातकोत्तर छात्रों को मौजूदा सरकारी नियमों और विनियमों के अनुसार पितृत्व अवकाश की अनुमति दी जाएगी।

ङ. 20 दिनों की सवैतनिक छुट्टी के अलावा, उम्मीदवारों को प्रति वर्ष 5 दिनों की शैक्षणिक सवैतनिक छुट्टी की अनुमति दी जाएगी।

प्रशिक्षण अवधि **अध्याय-2** के अनुसार होगी। यदि कोई उम्मीदवार अनुमत्य दिनों से अधिक छुट्टी लेता है, तो प्रशिक्षण अवधि पूरी करने के लिए उसकी अवधि उतने ही दिनों के लिए बढ़ा दी जाएगी। हालाँकि, 80% (अस्सी प्रतिशत) उपस्थिति होने पर ही कोई परीक्षा में शामिल हो सकेगा।

5.6 स्नातकोत्तर छात्रों को आवास

कॉलेज के लिए स्नातकोत्तर छात्रों को उचित आवासीय आवास प्रदान करना अनिवार्य होगा। हालाँकि, स्नातकोत्तर छात्रों के लिए छात्रावास में रहना अनिवार्य नहीं होगा।

अध्याय-VI

विश्वविद्यालयों की भूमिका

6.1 अपने अधीन चिकित्सा संस्थानों वाले सभी संबंधित विश्वविद्यालयों का यह कर्तव्य होगा कि वे राष्ट्रीय आयुर्विज्ञान आयोग के साथ साझेदारी करें -

क. छात्र को एक सक्षम विशेषज्ञ और/या चिकित्सा शिक्षक बनाने के लिए उच्च-गुणवत्ता और सस्ती स्नातकोत्तर चिकित्सा शिक्षा प्रदान करने के लिए एक उपयुक्त पाठ्यक्रम लागू करना।

ख. क्षमता-आधारित चिकित्सा शिक्षा प्रदान करना सुनिश्चित करने के लिए दृष्टिकोण, नैतिकता और संचार कौशल पर जोर देते हुए सैद्धांतिक ज्ञान के साथ-साथ नैदानिक और व्यावहारिक कौशल में प्रशिक्षण प्रदान करना।

ग. स्व-निर्देशित और सहायता प्राप्त शिक्षा दोनों में विद्वानों को प्रोत्साहित किया जाना चाहिए।

घ. उच्चतम वैश्विक मानकों को पूरा करने के लिए देश भर में चिकित्सा संस्थानों द्वारा प्रदान की जा रही चिकित्सा शिक्षा का आवधिक और पारदर्शी मूल्यांकन किया जाना।

ङ. स्नातकोत्तर कार्यक्रम के समग्र सफल समापन के लिए योगात्मक मूल्यांकन किया जाना।

च. सभी स्तरों पर आपात स्थितियों और आपदाओं से निपटने के लिए छात्रों में आत्मविश्वास पैदा किया जाना।

6.2 उपर्युक्त पर प्रतिकूल प्रभाव डाले बिना, संबंधित विश्वविद्यालय और उनके अधीन चिकित्सा संस्थान यह सुनिश्चित करेंगे कि कार्य का उचित रिकॉर्ड रखा जाए ताकि वे विद्वानों के उद्देश्यपूर्ण, कुशल और पारदर्शी आंतरिक मूल्यांकन का आधार बन सकें।

बशर्ते कि, इन बनाए गए और अच्छी तरह से वर्गीकृत दस्तावेजों को हर समय परामर्श के विशेष रूप से संबंधित विश्वविद्यालय या एनएमसी द्वारा चिकित्सा कॉलेज के मूल्यांकन के प्रयोजनों के लिए उपलब्ध कराया जाएगा।

6.3 संबंधित विश्वविद्यालय का यह निरंतर प्रयास रहेगा कि स्नातकोत्तर स्तर पर प्रशिक्षण की अवधि के दौरान संकाय, चिकित्सा शिक्षा विभाग और विद्वानों द्वारा विकसित प्रौद्योगिकी के इष्टतम उपयोग के लिए लगातार रणनीति विकसित की जाए।

6.4 संबंधित विश्वविद्यालय का यह निरंतर प्रयास रहेगा कि परीक्षा आयोजित करने और डिजिटल मोड में डिग्री/डिप्लोमा और अन्य प्रमाणपत्र जारी करने के लिए डिजिटल तकनीक का अधिकतम उपयोग किया जाए, जो डिजिलॉकर प्लेटफॉर्म पर उपलब्ध होना चाहिए। सभी विश्वविद्यालयों को यथाशीघ्र डिजिलॉकर प्लेटफॉर्म पर डिजिटल मोड में प्रमाणपत्र जारी करना शुरू करने के लिए हर संभव प्रयास करना चाहिए।

अध्याय-VII

विभाग, इकाइयाँ, संकाय और वरिष्ठ निवासी

7.1 **विभाग:** विभाग का नाम विशिष्ट विषय (अर्हता) के नाम के अनुसार होगा (**अनुलग्नक-1, अनुलग्नक-2**)। प्रत्येक विभाग का अध्यक्ष एक प्रोफेसर होगा।

इकाई: यदि लागू हो तो आंतरिक रोगी बिस्तरों वाले सभी विभागों में इकाई संरचना (इकाइयाँ) होंगी।

संकाय: प्रोफेसर, एसोसिएट प्रोफेसर और असिस्टेंट प्रोफेसर को फैकल्टी माना जाएगा और वे पूर्णकालिक होंगे। राष्ट्रीय आयुर्विज्ञान आयोग के दायरे में आने वाले चिकित्सा संस्थानों में स्नातकोत्तर चिकित्सा शिक्षा प्रदान करने वाले विभिन्न शिक्षण विशिष्टताओं में संकाय की नियुक्ति और पदोन्नति, चिकित्सा संस्थानों विनियमों में शिक्षक पात्रता अर्हता के मानदंडों के अनुसार होनी चाहिए। संकाय की आवश्यकता की संख्या और शिक्षण संकाय के अधीन पंजीकरण योग्य स्नातकोत्तर छात्रों की संख्या स्नातकोत्तर चिकित्सा शिक्षा विनियम, 2023 और पीजीएमएसआर-23.

सरकारी संस्थानों में, जहां अतिरिक्त प्रोफेसर का पद रखने वाले संकाय प्रोफेसर बनने के लिए सभी आवश्यकताओं को पूरा करते हैं, उन्हें सभी उद्देश्यों के लिए प्रोफेसर माना जाएगा। इसी प्रकार, सरकारी संस्थानों में, जहां रीडर का पद रखने वाले संकाय, सह-प्राध्यापक बनने के लिए सभी आवश्यकताओं को पूरा करते हैं, उन्हें सभी उद्देश्यों के लिए सह-प्राध्यापक माना जाएगा।

सीनियर रेजिडेंट्स और जूनियर रेजिडेंट्स: सीनियर रेजिडेंट के पास संबंधित ब्रॉड स्पेशलिटीमें स्नातकोत्तर डिग्री योग्यता होनी चाहिए। सुपर-स्पेशलिटी पाठ्यक्रम करने वाले स्नातकोत्तर छात्रों को भी वरिष्ठ निवासी कहा जाएगा। ब्रॉड स्पेशलिटीपाठ्यक्रम करने वाले छात्रों को जूनियर रेजिडेंट कहा जाएगा।

किसी अन्य निकाय जैसे चिकित्सा विज्ञान में राष्ट्रीय परीक्षा बोर्ड (नेशनल बोर्ड ऑफ एग्जामिनेशन इन मेडिकल साइंसेज) आदि के अधीन स्नातकोत्तर पाठ्यक्रम इन नियमों के अधीन पाठ्यक्रमों के लिए उन्हीं इकाइयों, शिक्षण कर्मियों और बुनियादी ढांचे के लिया स्वीकार्य नहीं हैं।

7.2 चिकित्सा महाविद्यालय/संस्थान के संकाय मूल्यांकन के उद्देश्य से और विशेषज्ञ आदि के रूप में जब भी आवश्यक हो, राष्ट्रीय आयुर्विज्ञान आयोग/बोर्डों की सहायता करेंगे।

7.3 चिकित्सा महाविद्यालय/संस्थान के डीन/निदेशक/प्रिंसिपल का पद किसी मान्यता प्राप्त/मान्यता प्राप्त संस्थान से मान्यता प्राप्त स्नातकोत्तर मेडिकल डिग्री रखने वाले व्यक्ति के पास होना चाहिए और जिसके पास चिकित्सा महाविद्यालय में प्रोफेसर/एसोसिएट प्रोफेसर के रूप में न्यूनतम दस साल का शिक्षण अनुभव हो और कम से कम पांच वर्ष विभाग में प्रोफेसर के पद पर कार्य किया हो। इन पदों पर नियुक्ति वरिष्ठता-सह-अर्हता के आधार पर की जाएगी। चिकित्सा संस्थान के डीन/निदेशक/प्रिंसिपल विभागाध्यक्ष का पद धारण नहीं करेंगे।

7.4 संबद्ध शिक्षण अस्पताल के चिकित्सा अधीक्षक के पास किसी मान्यता प्राप्त/प्रत्यायित संस्थान से मान्यता प्राप्त स्नातकोत्तर मेडिकल डिग्री होनी चाहिए, साथ ही अस्पताल के संबंधित विभागों में प्रोफेसर/एसोसिएट प्रोफेसर के रूप में न्यूनतम दस वर्ष का शिक्षण अनुभव होना चाहिए, जिसमें से कम से कम पांच वर्ष का शिक्षण अनुभव प्रोफेसर के रूप में

होने चाहिए। इन पदों पर नियुक्ति वरिष्ठता-सह-अर्हता के आधार पर की जाएगी। चिकित्सा अधीक्षक विभागाध्यक्ष के पद पर नहीं रहेंगे। हालाँकि, वह यूनिट का नेतृत्व कर सकते हैं।

अध्याय-VIII

परीक्षाएँ

8.1 परीक्षाएँ

चिकित्सा महाविद्यालय/संस्थान प्रारंभिक मूल्यांकन (परीक्षा) आयोजित करेगा और विश्वविद्यालय योगात्मक मूल्यांकन (परीक्षा) आयोजित करेगा।

प्रारंभिक मूल्यांकन (परीक्षा) और योगात्मक मूल्यांकन (परीक्षा) दोनों में थ्योरी, नैदानिक / प्रायौगिक और मौखिक परीक्षा शामिल होगी।

विश्वविद्यालय किसी भी विषय के लिए एक वर्ष में दो से अधिक परीक्षाएं आयोजित नहीं करेगा, दोनों परीक्षाओं के बीच कम से कम 4 और अधिक से अधिक 8 महीने का अंतराल नहीं होगा।

8.2 परीक्षकों

क. ब्रॉड और सुपर स्पेशलिटीज़ में स्नातकोत्तर परीक्षा के लिए परीक्षक (आंतरिक और बाह्य दोनों) के पास संबंधित विषय में मान्यता प्राप्त स्नातकोत्तर गाइड के रूप में तीन साल का अनुभव होगा।

ख. स्नातकोत्तर परीक्षा के लिए परीक्षकों की न्यूनतम संख्या चार होगी। जिनमें कम से कम दो बाहरी परीक्षक होंगे और उनमें कम से कम एक राज्य के बाहर अन्य विश्वविद्यालय से होगा।

ग. एक ही संस्थान के लिए लगातार दो से अधिक नियमित परीक्षाओं के लिए एक परीक्षक नियुक्त नहीं किया जाएगा।

8.3 कार्यविधि

क. ब्रॉड स्पेशलिटी: डॉक्टर ऑफ मेडिसिन (एमडी)/मास्टर ऑफ सर्जरी (एमएस) - किसी भी विषय में एमडी/एमएस परीक्षाओं में सैद्धांतिक पेपर, नैदानिक/प्रायोगिक और मौखिक परीक्षाएं शामिल होंगी।

(क) **सैद्धांतिक -** सैद्धांतिक परीक्षा (रचनात्मक और योगात्मक दोनों) एक प्रश्न प्रकार के वर्णनात्मक उत्तर, बहुविकल्पीय प्रश्न (एमसीक्यू) प्रकार या दोनों प्रकार के मिश्रण की हो सकती है। योगात्मक परीक्षा के लिए सैद्धांतिक परीक्षा चार सैद्धांतिक पेपरों की होगी। पहला और चौथा पेपर क्रमशः बुनियादी चिकित्सा विज्ञान और हालिया प्रगति पर होगा। पहला और चौथा पेपर क्रमशः बुनियादी चिकित्सा विज्ञान और हालिया प्रगति पर होगा।

सैद्धांतिक परीक्षा नैदानिक और व्यावहारिक परीक्षा से काफी पहले आयोजित की जाएगी।

(ख) **नैदानिक/प्रायोगिक और मौखिक परीक्षा:**

i. परामर्शदाता/विशेषज्ञ/शिक्षक के रूप में स्वतंत्र कार्य करने के लिए उम्मीदवारों के ज्ञान और क्षमता का परीक्षण करने के लिए नैदानिक विज्ञान में विषयों के लिए नैदानिक परीक्षा आयोजित की जाएगी, जिसके लिए उम्मीदवारों द्वारा प्रस्तुत एक लंबे मामले और दो छोटे मामलों की जांच की जाएगी।

ii. प्रयोगात्मक/प्रयोगशाला अध्ययन के आधार पर वैध और प्रासंगिक अवलोकन करने के लिए उम्मीदवारों के ज्ञान और क्षमता का परीक्षण करने के लिए अन्य विषयों के लिए प्रायोगिक परीक्षा आयोजित की जाएगी और ऐसे अध्ययन करने की उनकी क्षमता जो उनके विषय के लिए प्रासंगिक हैं, की जाँच की जाएगी।

iii. मौखिक परीक्षा संपूर्ण होगी और इसका उद्देश्य विषय, जांच प्रक्रियाओं, चिकित्सीय तकनीक और विशेषज्ञता के अन्य पहलुओं के बारे में उम्मीदवार के ज्ञान और क्षमता का आकलन करना होगा।

iv. नैदानिक/व्यावहारिक परीक्षा में वस्तुनिष्ठ संरचित नैदानिक परीक्षा (ओएससीई) शामिल होगी।

ख. सुपर स्पेशलिटी: डॉक्टरेट ऑफ मेडिसिन (डीएम)/मैजिस्टर चिरुर्जिया (एम.सीएच.) - परीक्षा में सिद्धांत और नैदानिक/प्रायोगिक और मौखिक परीक्षा शामिल हैं।

(क) सैद्धांतिक - सैद्धांतिक परीक्षा (रचनात्मक और योगात्मक दोनों) एक प्रश्न प्रकार के वर्णनात्मक उत्तर, बहुविकल्पीय प्रश्न (एमसीक्यू) प्रकार या दोनों प्रकार के मिश्रण की हो सकती है। योगात्मक परीक्षा के लिए सैद्धांतिक परीक्षा चार सैद्धांतिक पेपरों की होगी। पहला और चौथा पेपर क्रमशः बुनियादी चिकित्सा विज्ञान और हालिया प्रगति पर होगा।

सैद्धांतिक परीक्षा नैदानिक और व्यावहारिक परीक्षा से काफी पहले आयोजित की जाएगी।

(ख) नैदानिक/प्रायोगिक और मौखिक परीक्षा :

i. परामर्शदाता/विशेषज्ञ/शिक्षक के रूप में स्वतंत्र कार्य करने के लिए उम्मीदवारों के ज्ञान और क्षमता का परीक्षण करने के लिए नैदानिक विज्ञान में विषयों की नैदानिक परीक्षा आयोजित की जाएगी, जिसके लिए उम्मीदवारों द्वारा प्रस्तुत एक लंबे मामले और दो छोटे मामलों की जांच की जाएगी।

ii. प्रायोगिक परीक्षा में निदान और चिकित्सा के लिए विशेष जांच तकनीकों को शामिल करना शामिल हो सकता है। एम.सीएच. उम्मीदवारों की शल्य चिकित्सा प्रक्रियाओं में भी जांच की जाएगी। मौखिक परीक्षा इतनी व्यापक होगी कि उम्मीदवार के समग्र ज्ञान का परीक्षण किया जा सके और विषय, जांच प्रक्रियाओं, चिकित्सीय तकनीक और विशेषता के अन्य पहलुओं के बारे में क्षमता।

iii. नैदानिक/प्रायोगिक परीक्षा में वस्तुनिष्ठ संरचित नैदानिक परीक्षा (ओएससीई) शामिल होगी।

ग. स्नातकोत्तर डिप्लोमा - किसी भी विषय में डिप्लोमा परीक्षा में सैद्धांतिक और प्रायोगिक/नैदानिक और मौखिक परीक्षाएं शामिल होंगे।

(क) **सैद्धांतिक -** तीन सैद्धांतिक पेपर होंगे। पहला पेपर बेसिक चिकित्सा साइंसेज पर होगा। सैद्धांतिक परीक्षा नैदानिक परीक्षा से काफी पहले आयोजित की जाएगी।

(ख) **नैदानिक/प्रायोगिक और मौखिक परीक्षा -** नैदानिक विज्ञान विषय के लिए नैदानिक परीक्षा एक विशेषज्ञ के रूप में स्वतंत्र कार्य करने हेतु उम्मीदवार के ज्ञान और क्षमता का आकलन करने के उद्देश्य से आयोजित की जाएगी, जिसके लिए उम्मीदवार द्वारा प्रस्तुत न्यूनतम एक लंबे मामले और दो छोटे मामलों की जांच करनी होगी।

मौखिक परीक्षा संपूर्ण होगी और इसका उद्देश्य विषय, जांच प्रक्रियाओं, चिकित्सीय तकनीक और विशेषज्ञता के अन्य पहलुओं के बारे में उम्मीदवार के ज्ञान और क्षमता का आकलन करना होगा।

नैदानिक/प्रायोगिक परीक्षा में वस्तुनिष्ठ संरचित नैदानिक परीक्षा (ओएससीई) शामिल होगी

8.4 मूल्यांकन

क. संबंधित विश्वविद्यालय या अन्य विश्वविद्यालयों के अन्य महाविद्यालयों के सभी शिक्षक, जो स्नातकोत्तर परीक्षक बनने के पात्र हैं, उत्तर पुस्तिकाओं का मूल्यांकन कर सकते हैं।

ख. सभी उत्तर पुस्तिकाओं का संबंधित विश्वविद्यालय द्वारा दो मूल्यांकन किया जाएगा। पेपर के लिए दो मूल्यांकनकर्ताओं द्वारा दिए गए कुल अंकों का औसत, जिसे निकटतम मूल्य तक पूर्णांकित किया जाता है, परिणामों की गणना के लिए विचार किया जाएगा। सभी उत्तर पुस्तिकाएं, जहां दो मूल्यांकनों के बीच का अंतर पेपर के लिए निर्धारित कुल अंकों का 15% या अधिक है, तीसरे मूल्यांकन के अधीन होगी। पेपर के लिए तीन मूल्यांकनकर्ताओं द्वारा दिए गए सर्वोत्तम कुल दो अंकों के औसत को निकटतम पूर्णांक (पूर्ण संख्या) तक पूर्णांकित करके, परिणामों की अंतिम गणना के लिए विचार किया जाएगा।

ग. गणना और परिणामों की घोषणा के बाद, किसी भी परिस्थिति में पुनर्मूल्यांकन की अनुमति नहीं दी जाती है।

घ. स्नातकोत्तर पाठ्यक्रम प्रदान करने वाले सभी स्वास्थ्य विश्वविद्यालय/संस्थान डिजिटल मूल्यांकन लागू करेंगे।

एम.एस./एम.डी./एम.सीएच./डीएम पाठ्यक्रमों के मूल्यांकन के लिए मानदंड

क्र.सं.	विवरण	एम.एस./एम.डी./एम.सीएच./डीएम पाठ्यक्रम
1	सैद्धान्तिक	
	सैद्धान्तिक परीक्षा पत्रों की संख्या	4
	प्रत्येक सैद्धान्तिक परीक्षा पत्र के लिए अंक	100
	सैद्धान्तिक परीक्षा पत्रों का कुल अंक	400
	सैद्धान्तिक परीक्षा पत्र में उत्तीर्ण होने के लिए न्यूनतम अंक	200/400 (प्रत्येक परीक्षा पत्र में 40% न्यूनतम अंक)
2	**प्रायोगिक/नैदानिक**	300
3	**मौखिक परीक्षा**	100
	मौखिक परीक्षा सहित प्रायोगिक/नैदानिक परीक्षा पत्रों में उत्तीर्ण होने के लिए न्यूनतम अंक	200/400
	अभ्यर्थी को उत्तीर्ण होने वाले प्रत्येक विषय में कम से कम 50% अंक प्राप्त करने होंगे, जिनमे समिल है (1) सैद्धान्तिक - कुल 50% (इसके अलावा, प्रत्येक सैद्धान्तिक पत्र में एक उम्मीदवार को न्यूनतम 40% अंक प्राप्त करने होंगे) (2) प्रायोगिक/नैदानिक/मौखिक परीक्षा - कुल 50% (3) यदि कोई अभ्यर्थी एक विषय में भी असफल होता है, तो उसे सैद्धान्तिक और प्रायोगिक/नैदानिक/मौखिक परीक्षा दोनों के लिए फिर से उपस्थित होना होगा। (4) नैदानिक/प्रायोगिक और मौखिक परीक्षा के कुल अंकों का पांच प्रतिशत अंक (20 अंक) शोध निबंध/थीसिस का होगा और यह नैदानिक/प्रायोगिक परीक्षा के अंकों का हिस्सा होगा। राज्य के बाहर के बाहरी परीक्षक शोध प्रबंध/थीसिस का मूल्यांकन करेंगे और उस पर मौखिक परीक्षा लेंगे और शोध प्रबंध/थीसिस की गुणवत्ता और उसकी मौखिक परीक्षा पर प्रदर्शन के आधार पर अंक दिए जाएंगे। (5) स्नातकोत्तर परीक्षा में सैद्धान्तिक या प्रायोगिक के लिए किसी अनुग्रह अंक की अनुमति नहीं है।	

स्नातकोत्तर डिप्लोमा पाठ्यक्रम के मूल्यांकन के लिए मानदंड

क्र.सं.	विवरण	पी.जी. डिप्लोमा पाठ्यक्रम
1	सैद्धान्तिक	
	सैद्धान्तिक परीक्षा पत्रों की संख्या	3
	प्रत्येक सैद्धान्तिक परीक्षा पत्र के लिए अंक	100
	सैद्धान्तिक परीक्षा पत्रों का कुल अंक	300
	सैद्धान्तिक परीक्षा पत्र में उत्तीर्ण होने के लिए न्यूनतम अंक	150/300 (प्रत्येक परीक्षा पत्र में 40% न्यूनतम अंक)
2	**प्रायोगिक/नैदानिक**	200
3	मौखिक परीक्षा	100
	मौखिक परीक्षा सहित प्रायोगिक/नैदानिक परीक्षा पत्रों में उत्तीर्ण होने के लिए न्यूनतम अंक	150/300
	अभ्यर्थी को उत्तीर्ण होने के प्रत्येक विषय में कम से कम 50 अंक प्राप्त करने होंगे, जिनमे समिल है (1) सैद्धान्तिक - कुल 50% (इसके अलावा, प्रत्येक सैद्धान्तिक पत्र में एक उम्मीदवार को न्यूनतम 40% अंक प्राप्त करने	

	होंगे) (2) प्रायोगिक/नैदानिक/मौखिक परीक्षा - कुल 50% (3) यदि कोई अभ्यर्थी एक विषय में भी असफल होता है, तो उसे सैद्धान्तिक और प्रायोगिक/नैदानिक/मौखिक परीक्षा दोनों के लिए फिर से उपस्थित होना होगा। (4) स्नातकोत्तर परीक्षा में सैद्धान्तिक या प्रायोगिक के लिए किसी अनुग्रह अंक की अनुमति नहीं है।

अध्याय-IX

प्रतिबंध और जुर्माना

9.1 विनियमों के उल्लंघन के लिए जुर्माना - गैर-अनुपालन या चूक के लिए, पीजीएमईबी चिकित्सा महाविद्यालय/संस्थान को दंडित करेगा।

9.2 उपर्युक्त **धारा 9.1** में बताई गई किसी भी बात पर प्रतिकूल प्रभाव डाले बिना, जुर्माना लगाने में निम्नलिखित में से एक/अधिक/सभी शामिल हो सकते हैं –

क. चिकित्सा संस्थान द्वारा यथास्थिति सुधार/अनुपालन के निर्देश के साथ चेतावनी जारी करना;

ख. चिकित्सा संस्थान द्वारा किए गए प्रत्येक उल्लंघन/चूक के कृत्य के लिए एक करोड़ रुपये से अधिक का मौद्रिक जुर्माना नहीं;

ग. गलत घोषणा/दस्तावेज/अभिलेख (मरीजों के रिकॉर्ड सहित) प्रस्तुत करने वाले संकाय/ विभागाध्यक्ष (एचओडी)/डीन/निदेशक/डॉक्टर के लिए आर्थिक जुर्माना पांच लाख रुपये से अधिक नहीं होगा। इसके अलावा, उन पर व्यावसायिक आचरण विनियमों के तहत कदाचार का आरोप भी लगाया जा सकता है या दंडित किया जा सकता है;

घ. उस शैक्षणिक वर्ष या इतने वर्षों के लिए मौजूदा पाठ्यक्रम में सीटों की वृद्धि सहित किसी भी नए पाठ्यक्रम के लिए आवेदन की प्रक्रिया को रोकने के लिए मार्ब को सिफारिश करना;

ङ. चिकित्सा संस्थान द्वारा अगले या बाद के शैक्षणिक वर्षों में प्रवेश पाने वाले छात्रों की संख्या कम करना;

च. अगले या आगामी शैक्षणिक वर्षों में एक या अधिक पाठ्यक्रमों में प्रवेश रोकना;

छ. अनुमति वापस लेने के लिए एनएमसी को सिफारिश करना;

ज. व्यक्तियों या एजेंसी के माध्यम से पीजीएमईबी या एनएमसी पर दबाव डालने का कोई भी प्रयास चिकित्सा संस्थान द्वारा आवेदन/अनुरोध की प्रक्रिया को तत्काल रोक देगा;

बशर्ते कि चिकित्सा संस्थान को कमियों को सुधारने के लिए उचित अवसर दिया जा सकता है और यदि वह अपेक्षित मानदंडों को पूरा करने में विफल रहता है तो आगे कोई कार्रवाई की जाएगी। बशर्ते कि, पीजीएमईबी या एनएमसी उस समय लागू आपराधिक कानून के अनुसार झूठी जानकारी प्रस्तुत करने, या झूठे दस्तावेजों के निर्माण के लिए आपराधिक कार्यवाही भी शुरू कर सकता है।

अध्याय-X

विविध

10.1 संकाय विकास कार्यक्रम - स्नातकोत्तर चिकित्सा शिक्षा बोर्ड स्नातकोत्तर प्रशिक्षण के लिए संकाय के कौशल को बढ़ाने के लिए संकाय विकास कार्यक्रम निर्धारित करेगा, जिसका अनिवार्य रूप से पालन करना होगा।

10.2 पशु प्रयोग - चिकित्सा संस्थानों में शरीर क्रिया विज्ञान एवं औषध विज्ञान में स्नातकोत्तर पाठ्यक्रमों के अर्हता आधारित पाठ्यक्रम में पशु प्रयोग को एक अभिन्न अंग के रूप में शामिल किया जाना चाहिए।

हालाँकि, जहाँ भी संभव हो, इन विषयों में स्नातकोत्तर छात्रों के शिक्षण और प्रशिक्षण के लिए गैर-पशु, मानव प्रासंगिक तरीकों के उपयोग को प्रोत्साहित किया जा सकता है। यदि जानवरों का उपयोग अनुसंधान अध्ययन या थीसिस कार्य के एक भाग के रूप में किया जाता है, तो जैव चिकित्सा संबंधी नैतिकता और पशु क्रूरता निवारण अधिनियम, 1960 के तहत बनाए गए प्रासंगिक नियमों और दिशानिर्देशों का सख्ती से पालन किया जाना चाहिए।

10.3 सहयोगात्मक अनुसंधान - उत्कृष्टता के अन्य वैज्ञानिक संगठनों के साथ-साथ भारत सरकार द्वारा प्रदत्त प्रतिष्ठित/उत्कृष्टता संस्थानों के साथ सहयोगात्मक व्यवस्था द्वारा उच्चतम क्षमता के चिकित्सक वैज्ञानिक तैयार करने के लिए चिकित्सा क्षेत्र में अनुसंधान को प्रोत्साहन प्रदान किया जा सकता है। आयुष के साथ अंतर-विषयक अनुसंधान को प्रोत्साहित किया जा सकता है।

अध्याय-XI

संशोधन, बचत खंड और निरसन

11.1 स्नातकोत्तर चिकित्सा शिक्षा विनियम-2023 में संशोधन का प्रावधान - राष्ट्रीय आयुर्विज्ञान आयोग को आवश्यकता पड़ने पर स्नातकोत्तर चिकित्सा शिक्षा विनियम-2023 में कोई भी अतिरिक्त, विलोपन, प्रतिस्थापन या कोई अन्य संशोधन करने का अधिकार है। स्नातकोत्तर चिकित्सा शिक्षा बोर्ड को आवश्यकता पड़ने पर सलाह और स्पष्टीकरण जारी करने का अधिकार है। जिला रेजीडेंसी कार्यक्रम (डीआरपी) की देखरेख के लिए **धारा 5.2 (xv)XII** के अधीन गठित राष्ट्रीय संचालन समिति उद्देश्यों को प्राप्त करने के लिए जिला रेजीडेंसी कार्यक्रम को लागू करने में व्यावहारिक तरीके सुझाएगी।

11.2 बचत खण्ड - इन विनियमों में निहित किसी भी बात के बावजूद, "स्नातकोत्तर चिकित्सा शिक्षा विनियम, 2000" या "अध्ययन या प्रशिक्षण के एक नए या उच्च पाठ्यक्रम का उद्घाटन (अध्ययन या प्रशिक्षण के स्नातकोत्तर पाठ्यक्रम सहित) और वृद्धि" के तहत की गई कोई भी कार्रवाई अध्ययन या प्रशिक्षण के किसी भी पाठ्यक्रम में प्रवेश क्षमता (अध्ययन या प्रशिक्षण के स्नातकोत्तर पाठ्यक्रम सहित) विनियम, 2000" या उससे पहले की परिषदों की सिफारिश को संरक्षित किया जाएगा।

11.3 निरसन - "स्नातकोत्तर चिकित्सा शिक्षा विनियम, 2000" और "अध्ययन या प्रशिक्षण के एक नए या उच्च पाठ्यक्रम का उद्घाटन (अध्ययन या प्रशिक्षण के स्नातकोत्तर पाठ्यक्रम सहित) और अध्ययन या प्रशिक्षण के किसी भी पाठ्यक्रम में प्रवेश क्षमता में वृद्धि (सहित) अध्ययन या प्रशिक्षण का स्नातकोत्तर पाठ्यक्रम) विनियम, 2000" को इसके द्वारा निरस्त किया जाता है।

डॉ. विपुल अग्रवाल, सचिव

[विज्ञापन-III/4/असा./655/2023-24]

टिप्पणी: ये विनियम अंग्रेजी और हिंदी दोनों भाषाओं में प्रकाशित किया जा रहे हैं, इन विनियमों की व्याख्या के बारे में कोई भी संदेह होने पर अंग्रेजी संस्करण ही मान्य होगा।

अनुबंध 1

[*अध्याय-II देखें*]

मान्यता प्राप्त स्नातकोत्तर अर्हताएं की सूची (एमडी/एमएस)

क. एम.डी. (डॉक्टर ऑफ मेडिसिन)

1. एम.डी. (विमानन आयुर्विज्ञान)
2. एम.डी. (शरीर रचना विज्ञान)
3. एम.डी. (संज्ञाहरण विज्ञान)
4. एम.डी. (जैव रसायन)
5. एम.डी. (जैव भौतिकी)
6. एम.डी. (सामुदाय चिकित्सा)
7. एम.डी. (त्वचा-रोग विज्ञान, रतिज रोग और कुष्ठरोग विज्ञान)
8. एम.डी. (आपात आयुर्विज्ञान)
9. एम.डी. (पारिवार आयुर्विज्ञान)
10. एम.डी. (न्याय-वैधक आयुर्विज्ञान और विषाणु विज्ञान)

11. एम.डी. (सामान्य आयुर्विज्ञान)
12. एम.डी. (जरा-चिकित्सा)
13. एम.डी. (स्वास्थ्य प्रशासन)
14. एम.डी. (अस्पताल प्रशासन)
15. एम.डी. (प्रतिरक्षा रूधिर विज्ञान एव रक्तधान)
16. एम.डी. (प्रयोगशाला मेडिसीन)
17. एम.डी. (मेरीन मेडिसीन)
18. एम.डी. [मास्टर ऑफ पब्लिक हेल्थ (महामारी विज्ञान)]
19. एम.डी. (सूक्ष्म जीवविज्ञान)
20. एम.डी. (नाभिकीय आयुर्विज्ञान)
21. एम.डी. (बाल चिकित्सा विज्ञान)
22. एम.डी. (पेलिएटीव मेडिसिन)
23. एम.डी. (विकृति विज्ञान)
24. एम.डी. (भेषजगुन विज्ञान)
25. एम.डी. (शारीरिक आयुर्विज्ञान पुन:स्थापना)
26. एम.डी. (शरीर क्रिया विज्ञान)
27. एम.डी. (मनोविकार चिकित्सा)
28. एम.डी. (विकिरण अर्बुद विज्ञान)
29. एम.डी. (विकिरण निदान)
30. एम.डी. (श्वसन आयुर्विज्ञान)
31. एम.डी. (क्रीड़ा आयुर्विज्ञान)
32. एम.डी. (उष्णकटिबंधीय मेडिसीन)

ख. **एम.एस. (मास्टर ऑफ सर्जरी)**

1. एम.एस. (सामान्य शल्य चिकित्सा)
2. एम.एस. (प्रसूति एवं स्त्री रोग)
3. एम.एस. (नेत्र विज्ञान)
4. एम.एस. (हड्डी रोग)
5. एम.एस. (कर्णनासाकंठ विज्ञान)
6. एम.एस. (अभिघात विज्ञान और सर्जरी)

अनुबंध-2

[*अध्याय-// देखें*]

मान्यता प्राप्त स्नातकोत्तर सुपर स्पेशलिटी अर्हताएं की सूची (डीएम/एमसीएच)

क. डॉक्टरेट ऑफ मेडिसिन

1. डी.एम.(हृद चिकित्सा संज्ञाहरण)

2. डी.एम.(हृद चिकित्सा विज्ञान)
3. डी.एम.(बाल एवं किशोर मनोरोग चिकित्सा)
4. डी.एम.(रोगलक्षण रूधिर विज्ञान)
5. डी.एम.(रोगलक्षण प्रतिरक्षा एवं रुमेटोलॉजी)
6. डी.एम. (नैदानिक औषध विज्ञान)
7. डी.एम.(संवेदनशील देखभाल आयुर्विज्ञान)
8. डी.एम.(अन्तःस्रविकी विज्ञान)
9. डी.एम.(जरा चिकित्सा मानसिक स्वास्थ्य)
10. डी.एम.(यकृत विज्ञान)
11. डी.एम.(संक्रामक रोग)
12. डी.एम.(इंटरवेंशनल विकिरण विज्ञान)
13. डी.एम.(आयुर्विज्ञान जठरान्त्र रोग विज्ञान)
14. डी.एम.(आयुर्विज्ञान अनुवंशिकी)
15. डी.एम.(आयुर्विज्ञान अर्बुद विधा विज्ञान)
16. डी.एम.(नवजात शिशु विज्ञान)
17. डी.एम.(वृक्क विज्ञान)
18. डी.एम.(तंत्रिका संज्ञाहरण)
19. डी.एम.(तंत्रिका विज्ञान)
20. डी.एम.(तंत्रिका विकिरण विज्ञान)
21. डी.एम.(ऑनको पैथोलॉजी)
22. डी.एम.(अंग प्रत्यारोपण संज्ञाहरण एवं संवेदनशील देखभाल)
23. डी.एम.(बाल चिकित्सा एवं शिशु संज्ञाहरण)
24. डी.एम.(बाल एवं हृद चिकित्सा विज्ञान)
25. डी.एम.(बाल चिकित्सा और संवेदनशील देखभाल)
26. डी.एम.(बाल चिकित्सा जठरान्त्र रोग विज्ञान)
27. डी.एम.(बाल चिकित्सा यकृत विज्ञान)
28. डी.एम.(बाल चिकित्सा वृक्क विज्ञान)
29. डी.एम.(बाल चिकित्सा तंत्रिका विज्ञान)
30. डी.एम.(बाल चिकित्सा अर्बुद विधा विज्ञान)
31. डी.एम.(फुफ्फुस काय चिकित्सा)
32. डी.एम.(रतिज रोग विज्ञान)

ख. एम.सीएच. (मेजिस्टर चीरूगी)

1. एम.सीएच.(अन्तःस्रावी शल्यक्रिया)
2. एम.सीएच.(स्त्री रोग अर्बुद विधा विज्ञान)

3. एम.सीएच.(हस्त शल्य चिकित्सा)
4. एम.सीएच.(सिर एवं गला शल्य चिकित्सा)
5. एम.सीएच.(यकृत-अग्न्याशय-बिलियरी-शल्य चिकित्सा)
6. एम.सीएच.(तंत्रिका शल्य चिकित्सा)
7. एम.सीएच.(बाल चिकित्सा एवं हृद वाहिका वक्ष शल्य चिकित्सा)
8. एम.सीएच.(बाल चिकित्सा अस्थिरोग विज्ञान)
9. एम.सीएच.(बाल चिकित्सा शल्य चिकित्सा)
10. एम.सीएच.(सुघट्य एवं पुनःरचना शल्य चिकित्सा)
11. एम.सीएच.(प्रजनन आयुर्विज्ञान एवं शल्यक्रिया)
12. एम.सीएच.(शल्य चिकित्सा जठरान्त्र रोग विज्ञान)
13. एम.सीएच.(शल्य चिकित्सा अर्बुद विधा विज्ञान)
14. एम.सीएच.(यूरोलॉजी)
15. एम.सीएच (संवहनी सर्जरी)
16. एम.सीएच.(हृद संवहनी और वक्षीय शल्यक्रिया)

अनुबंध-3

[*अध्याय-II देखें*]

मान्यता प्राप्त स्नातकोत्तर डिप्लोमा अर्हताएं की सूची

1. प्रत्यूर्जता एवं नैदानिक प्रतिरक्षा विज्ञान
2. संज्ञाहरण विज्ञान (डी.ए.)
3. नैदानिक विकृति विज्ञान (डी.सी.पी.)
4. सामुदायिक आयुर्विज्ञान (डी.सी.एम.)/लोक स्वास्थ्य (डी.पी.एच.)
5. त्वचारोग, रतिज रोग एवं कुष्ठ रोग (डी.डी.वी.एल.)
6. न्याय-वैद्यक आयुर्विज्ञान (डी.एफ.एम.)
7. स्वास्थ्य शिक्षा (डी.एच.ई.)
8. स्वास्थ्य प्रशासन (डी.एच.ए)
9. प्रतिरक्षा रुधिर विज्ञान एवं रक्ताधान (डी.आई.एच.बी.टी.)
10. समुद्री आयुर्विज्ञान (समुद्री आयुर्विज्ञान डिप्लोमा)
11. सूक्ष्मजीव विज्ञान (सूक्ष्मजीव विज्ञान डिप्लोमा)
12. पोषण (पोषणज डिप्लोमा)
13. प्रसूति विज्ञान एवं स्त्री रोग विज्ञान (डी.जी.ओ.)
14. व्यावसायिक स्वास्थ्य (डी.ओ.एच.)
15. नेत्र विज्ञान (डी.ओ.)
16. अस्थिरोग विज्ञान (अस्थिरोग विज्ञान डिप्लोमा)

17. कर्ण-नासा-कंठ विज्ञान (डी.एल.ओ.)
18. बाल चिकित्सा विज्ञान (डी.सी.एच.)
19. शारीरिक चिकित्सा एवं पुनःस्थापन (शारीरिक चिकित्सा एवं पुनःस्थापन डिप्लोमा)
20. मनोविकार चिकित्सा (डी.पी.एम.)
21. विकिरण आयुर्विज्ञान (डी.आर.एम.)
22. विकिरण निदान (डी.एम.आर.डी.)
23. विकिरण चिकित्सा (डी.एम.आर.टी.)
24. विकिरण चिकित्सा भौतिकी विज्ञान (डी.आर.पी.)
25. क्रीडा आयुर्विज्ञान (डी.एस.एम.)
26. उष्णकटिबंधीय आयुर्विज्ञान एवं स्वास्थ्य (डी.टी.एम.एंड एच.)
27. यक्ष्मा एवं वक्षरोग (डी.टी.सी.डी.)
28. विषाणु विज्ञान (डी.वीर.)

अनुबंध- 4

[*अध्याय-II देखें*]

मान्यता प्राप्त पोस्ट-डॉक्टरल सर्टिफिकेट पाठ्यक्रम (पीडीसीसी) अर्हताएं की सूची

1. अंग प्रत्यारोपण संज्ञाहरण में पीडीसीसी
2. बाल चिकित्सा अंतःस्रावी में पीडीसीसी
3. प्रयोगशाला प्रतिरक्षा में पीडीसीसी
4. नाभिकीय वृक्क विज्ञान में पीडीसीसी
5. गुर्दा विकृति विज्ञान में पीडीसीसी
6. जठर विकिरण में पीडीसीसी
7. एफ़ेरेसिस प्रौद्योगिकी और रक्त घटक चिकित्सा में पीडीसीसी
8. दर्द प्रबंधन में पीडीसीसी
9. रुधिर अर्बुदविज्ञान में पीडीसीसी
10. बाल चिकित्सा अंतःस्रावी में पीडीसीसी
11. बाल चिकित्सा कर्णनासा कंठ विज्ञान में पीडीसीसी
12. मेरुदण्ड शल्य चिकित्सा में पीडीसीसी

अनुबंध- 5

[*अध्याय-// देखें*]

मान्यता प्राप्त पोस्ट-डॉक्टरल फ़ेलोशिप (पीडीएफ) अर्हताएं की सूची

अनुबंध- 6

[*अध्याय-// देखें*]

छह साल की अवधि के डीएम/एम.सीएच पाठ्यक्रमों की सूची

1. डी.एम. (तन्त्रिका-विज्ञान)
2. एम.सीएच. (तंत्रिका शल्य चिकित्सा)

अनुबंध-7

[धारा 4.1 देखें]

सुपर स्पेशलिटी पाठ्यक्रमों के लिए फीडर ब्रॉड स्पेशलिटी अर्हताएं

क. डी.एम. (डॉक्टरेट ऑफ मेडिसिन)

क्र.सं.	विशेषज्ञता का क्षेत्र	फीडर ब्रॉड स्पेशलिटीअर्हताओं
1.	डी.एम.(हृद चिकित्सा संज्ञाहरण)	एम.डी./डीएनबी (संज्ञाहरण)
2.	डी.एम.(हृद चिकित्सा विज्ञान)	एम.डी./डीएनबी (सामान्य काय चिकित्सा) एम.डी./डीएनबी (बाल चिकित्सा विज्ञान) एम.डी./डीएनबी (श्वसन काय चिकित्सा)
3.	डी.एम.(बाल एवं किशोर मनोरोग चिकित्सा)	एम.डी./डीएनबी (मनोविकार चिकित्सा)
4.	डी.एम.(नैदानिक रूधिर विज्ञान)	एम.डी./डीएनबी (जीव-रसायन) एम.डी./डीएनबी (सामान्य काय चिकित्सा) एम.डी./डीएनबी (बाल चिकित्सा विज्ञान) एम.डी./डीएनबी (विकृति विज्ञान)
5.	डी.एम.(नैदानिक प्रतिरक्षा एवं रुमेटोलॉजी)	एम.डी./डीएनबी (सामान्य काय चिकित्सा) एम.डी./डीएनबी (बाल चिकित्सा विज्ञान)
6.	डी.एम.(नैदानिक औषध विज्ञान)	एम.डी./डीएनबी (औषध विज्ञान)
7.	डी.एम.(संवेदनशील देखभाल)	एम.डी./डीएनबी (संज्ञाहरण) एम.डी./डीएनबी (सामान्य चिकित्सा) एम.डी./डीएनबी (बाल चिकित्सा विज्ञान) एम.डी./डीएनबी (श्वसन काय चिकित्सा) एम.डी./डीएनबी (आपात चिकित्सा विज्ञान)
8.	डी.एम.(अन्तःस्रविकी विज्ञान)	एम.डी./डीएनबी (सामान्य काय चिकित्सा) एम.डी./डीएनबी (बाल चिकित्सा विज्ञान)
9.	डी.एम.(जरा चिकित्सा मानसिक स्वास्थ्य)	एम.डी./डीएनबी (मनोविकार चिकित्सा)
10.	डी.एम.(यकृत विज्ञान)	एम.डी./डीएनबी (सामान्य काय चिकित्सा) एम.डी./डीएनबी (बाल चिकित्सा विज्ञान)
11.	डी.एम.(संक्रामक रोग)	एम.डी./डीएनबी (सामान्य काय चिकित्सा) एम.डी./डीएनबी (बाल चिकित्सा विज्ञान) एम.डी./डीएनबी (सूक्ष्म जीव विज्ञान) एम.डी./डीएनबी (श्वसन काय चिकित्सा) एम.डी./डीएनबी(उष्णकटिबंधीय चिकित्सा)
12.	डी.एम.(इंटरवेंशनल विकिरण विज्ञान)	एम.डी./डीएनबी (विकिरण निदान)
13.	डी.एम.(जठरान्त्र रोग विज्ञान)	एम.डी./डीएनबी (सामान्य काय चिकित्सा)

क्र.सं.	विशेषज्ञता का क्षेत्र	फीडर ब्रॉड स्पेशलिटीअर्हताओं
14.	डी.एम.(अनुवंशिकी चिकित्सा)	किसी भी विषय में एम.डी./एम.एस./ डीएनबी
15.	डी.एम.(आयुर्विज्ञान अर्बुद विधा विज्ञान)	एम.डी./डीएनबी (सामान्य काय चिकित्सा) एम.डी./डीएनबी (बाल चिकित्सा विज्ञान) एम.डी./डीएनबी (विकिरण अर्बुद विज्ञान)
16.	डी.एम.(नवजात शिशु विज्ञान	एम.डी./डीएनबी (बाल चिकित्सा विज्ञान)
17.	डी.एम.(वृक्क विज्ञान)	एम.डी./डीएनबी (सामान्य काय चिकित्सा) एम.डी./डीएनबी (बाल चिकित्सा विज्ञान)
18.	डी.एम.(तंत्रिका संज्ञाहरण)	एम.डी./डीएनबी (संज्ञाहरण विज्ञान)
19.	डी.एम.(तंत्रिका विज्ञान)	एम.डी./डीएनबी (सामान्य काय चिकित्सा) एम.डी./डीएनबी (बाल चिकित्सा विज्ञान)
20.	डी.एम.(तंत्रिका विकिरण विज्ञान)	एम.डी./डीएनबी (विकिरण निदान)
21.	डी.एम.(अर्बुद विकृति विज्ञान)	एम.डी./डीएनबी (विकृति विज्ञान)
22.	डी.एम.(अंग प्रत्यारोपण संज्ञाहरण एवं संवेदनशील देखभाल)	एम.डी./डीएनबी (संज्ञाहरण विज्ञान)
23.	डी.एम.(बाल चिकित्सा एवं शिशु संज्ञाहरण)	एम.डी./डीएनबी (संज्ञाहरण विज्ञान)
24.	डी.एम.(बाल एवं हृद चिकित्सा विज्ञान)	एम.डी./डीएनबी (बाल चिकित्सा विज्ञान)
25.	डी.एम.(बल चिकित्सा और संवेदनशील देखभाल)	एम.डी./डीएनबी (बाल चिकित्सा विज्ञान)
26.	डी.एम.(बाल चिकित्सा जठरान्त्र रोग विज्ञान)	एम.डी./डीएनबी (बाल चिकित्सा विज्ञान)
27.	डी.एम.(बाल चिकित्सा यकृत विज्ञान)	एम.डी./डीएनबी (बाल चिकित्सा विज्ञान)
28.	डी.एम.(बाल चिकित्सा वृक्क विज्ञान)	एम.डी./डीएनबी (बाल चिकित्सा विज्ञान)
29.	डी.एम.(बाल चिकित्सा तंत्रिका विज्ञान)	एम.डी./डीएनबी (बाल चिकित्सा विज्ञान)
30.	डी.एम.(बाल चिकित्सा अर्बुद विधा विज्ञान)	एम.डी./डीएनबी (बाल चिकित्सा विज्ञान)
31.	डी.एम.(फुफ्फुस काय चिकित्सा)	एम.डी./डीएनबी (सामान्य काय चिकित्सा) एम.डी./डीएनबी (श्वसन काय चिकित्सा) एम.डी./डीएनबी (बाल चिकित्सा विज्ञान)
32.	डी.एम.(रतिज रोग विज्ञान)	एम.डी./डीएनबी (सूक्ष्म जीवविज्ञान)

ख. एम.सीएच. (मेजिस्टर चीरूगी)

क्र.सं.	विशेषज्ञता का क्षेत्र	फीडर ब्रॉड स्पेशलिटीअर्हताओं
1.	एम.सीएच.(अन्तःस्रावी शल्यक्रिया)	एम.एस./डीएनबी (सामान्य शल्य चिकित्सा)
2.	एम.सीएच.(स्त्री रोग अर्बुद विधा विज्ञान)	एम.डी./एम.एस./डीएनबी (प्रसूति एवं स्त्री रोग विज्ञान)
3.	एम.सीएच.(हस्त शल्य चिकित्सा)	एम.एस./डीएनबी (अस्थिरोग विज्ञान)

क्र.सं.	विशेषज्ञता का क्षेत्र	फीडर ब्रॉड स्पेशलिटीअहर्ताओं
4.	एम.सीएच.(सिर एवं गला शल्य चिकित्सा)	एम.एस./डीएनबी (कर्णनासा कंठ विज्ञान) एम.एस./डीएनबी (सामान्य शल्य चिकित्सा)
5.	एम.सीएच.(यकृत-अग्न्याशय-बिलियरी-शल्य चिकित्सा)	एम.एस./डीएनबी (सामान्य शल्य चिकित्सा)
6.	एम.सीएच.(तंत्रिका शल्य चिकित्सा)	एम.एस./डीएनबी (शल्य चिकित्सा) एम.एस./डीएनबी (कर्णनासा कंठ विज्ञान)
7.	एम.सीएच.(बाल चिकित्सा एवं हृद वाहिका वक्ष शल्य चिकित्सा)	एम.एस./डीएनबी (सामान्य शल्य चिकित्सा)
8.	एम.सीएच.(बाल चिकित्सा अस्थिरोग विज्ञान)	एम.एस./डीएनबी (अस्थिरोग विज्ञान)
9.	एम.सीएच.(बाल चिकित्सा शल्य चिकित्सा)	एम.एस./डीएनबी (सामान्य शल्य चिकित्सा)
10.	एम.सीएच.(सुघट्य एवं पुनःरचना शल्य चिकित्सा)	एम.एस./डीएनबी (सामान्य शल्य चिकित्सा) एम.एस./डीएनबी (कर्णनासा कंठ विज्ञान)
11.	एम.सीएच.(प्रजनन आयुर्विज्ञान एवं शल्यक्रिया)	एम.डी./एम.एस./डीएनबी (प्रसूति एवं स्त्री रोग विज्ञान)
12.	एम.सीएच.(शल्य चिकित्सा जठरान्त्र रोग विज्ञान)	एम.एस./डीएनबी (सामान्य शल्य चिकित्सा)
13.	एम.सीएच.(शल्य चिकित्सा अर्बुद विधा विज्ञान)	एम.एस./डीएनबी (सामान्य शल्य चिकित्सा) एम.एस./डीएनबी (कर्णनासा कंठ विज्ञान) एम.एस./डीएनबी (अस्थि रोग विज्ञान)
14.	एम.सीएच.(यूरोलॉजी)	एम.एस./डीएनबी (सामान्य शल्य चिकित्सा)
15.	एम.सीएच. (संवहनी सर्जरी)	एम.एस./डीएनबी (सामान्य शल्य चिकित्सा)
16.	एम.सीएच. (कार्डियोवास्कुलर)	एम.एस./डीएनबी (सामान्य शल्य चिकित्सा)

अनुबंध-8

[धारा 4.8 देखें]

विकलांग व्यक्तियों के अधिकार (आरपीडब्ल्यूडी) अधिनियम, 2016 की अनुसूची

"विनिर्दिष्ट विकलांगता"

1. शारीरिक विकलांगता

क. लोकोमोटर विकलांगता (किसी व्यक्ति की मस्कुलोस्केलेटल या तंत्रिका तंत्र या दोनों की वेदना के परिणामस्वरूप स्वयं और वस्तुओं की गति से जुड़ी विशिष्ट गतिविधियों को निष्पादित करने में असमर्थता), जिसमें शामिल हैं –

(क) "कुष्ठ रोग से ठीक हुआ व्यक्ति" का अर्थ वह व्यक्ति है जो कुष्ठ रोग से ठीक हो गया है लेकिन निम्नरूप से पीड़ित है –

(i) हाथों या पैरों में संवेदना की हानि के साथ-साथ आंख और पलक में संवेदना और पैरेसिस की हानि, लेकिन कोई स्पष्ट विकृति नहीं;

(ii) स्पष्ट विकृति और पक्षाघात लेकिन उनके हाथों और पैरों में पर्याप्त गतिशीलता हो ताकि वे सामान्य आर्थिक गतिविधि में संलग्न हो सकें;

(iii) अत्यधिक शारीरिक विकृति के साथ-साथ बढ़ती उम्र जो उसे किसी भी लाभकारी व्यवसाय को करने से रोकती है, और अभिव्यक्ति "कुष्ठ ठीक हो गया" को तदनुसार समझा जाएगा;

(ख) "सेरेब्रल पाल्सी" से अभिप्रेत है शरीर की गतिविधियों और मांसपेशियों के समन्वय को प्रभावित करने वाली गैर-प्रगतिशील न्यूरोलॉजिकल स्थिति का एक समूह जो मस्तिष्क के एक या अधिक विशिष्ट क्षेत्रों को होने वाली क्षति के कारण होता है, जो आमतौर पर जन्म से पहले, उसके दौरान या उसके तुरंत बाद होता है;

(ग) "बौनापन" से अभिप्रेत है एक चिकित्सीय या आनुवंशिक स्थिति जिसके परिणामस्वरूप एक वयस्क की ऊंचाई 4 फीट 10 इंच (147 सेंटीमीटर) या उससे कम होती है;

(घ) "मस्कुलर डिस्ट्रॉफी" से अभिप्रेत है वंशानुगत आनुवंशिक मांसपेशी रोग का एक समूह जो मानव शरीर को हिलाने वाली मांसपेशियों को कमजोर करता है और मल्टीपल डिस्ट्रॉफी वाले व्यक्तियों के जीन में गलत और गायब जानकारी होती है, जो उन्हें स्वस्थ मांसपेशियों के लिए आवश्यक प्रोटीन बनाने से रोकती है। यह प्रगतिशील कंकाल की मांसपेशियों की कमजोरी, मांसपेशियों के प्रोटीन में दोष, और मांसपेशियों की कोशिकाओं और ऊतकों की मृत्यु की विशेषता है;

(ङ) "एसिड अटैक पीड़ित" से एसिड या इसी तरह के संक्षारक पदार्थ फेंकने से हुए हिंसक हमलों के कारण विकृत हुआ व्यक्ति अभिप्रेत है।

ख. दृष्टि क्षति –

(क) "नेत्रहीनता" से अभिप्रेत ऐसी स्थिति है जहां सर्वोत्तम सुधार के बाद किसी व्यक्ति में निम्नसैद्धांतिक में से कोई भी स्थिति होती है-

(i) दृष्टि की पूर्ण अनुपस्थिति; या

(ii) सर्वोत्तम संभव सुधार के साथ बेहतर आंख में दृश्य तीक्ष्णता 3/60 से कम या 10/200 (स्नेलेन) से कम; या

(iii) 10 डिग्री से कम का कोण अंतरित करने वाले दृष्टि क्षेत्र की सीमा।

(ख) "निम्न दृष्टि" से अभिप्रेत ऐसी स्थिति है जहां किसी व्यक्ति को निम्नसैद्धांतिक में से कोई भी स्थिति हो, अर्थात्: -

(i) सर्वोत्तम संभव सुधार के साथ बेहतर आंख में दृश्य तीक्ष्णता 6/18 से अधिक या 20/60 से 3/60 तक या 10/200 (स्नेलेन) तक नहीं होनी चाहिए; या

(ii) 40 डिग्री से कम के कोण को 10 डिग्री तक अंतरित करने वाले दृष्टि क्षेत्र की सीमा।

ग. श्रवण क्षति -

(क) "बधिर" से अभिप्रेत है ऐसा व्यक्ति जिन्हें दोनों कानों में बोलने की आवृत्ति में 70 डीबी श्रवण क्षति वाले व्यक्ति;

(ख) "कम सुनने वाला" से अभिप्रेत ऐसा व्यक्ति है जिसे दोनों कानों में बोलने की आवृत्ति में 60 डीबी से 70 डीबी सुनने की हानि वाला व्यक्ति;

घ. "वाक् और भाषा विकलांगता" से अभिप्रेत है आंगिक या तंत्रिका संबंधी कारणों से भाषण और भाषा के एक या अधिक घटकों को प्रभावित करने वाली लेरिंजेक्टॉमी या वाचाघात जैसी स्थितियों से उत्पन्न होने वाली स्थायी विकलांगता।

2. **बौद्धिक विकलांगता, से** एक ऐसी स्थिति अभिप्रेत है जो बौद्धिक कार्यप्रणाली (तर्क, सीखना, समस्या समाधान) और अनुकूल व्यवहार दोनों में महत्वपूर्ण सीमा की विशेषता रखती है, जिसमें हर दिन, सामाजिक और व्यावहारिक कौशल की एक श्रृंखला शामिल है –

(क) "विशिष्ट सीखने की अक्षमता" **से** स्थितियों का एक विषम समूह अभिप्रेत है जिसमें बोली जाने वाली या सैद्धांतिक भाषा को संसाधित करने में कमी होती है, जो समझने, बोलने, पढ़ने, लिखने, वर्तनी या गणितीय गणना करने में कठिनाई के रूप में प्रकट हो सकती है और इसमें अवधारणात्मक विकलांगता, डिस्लेक्सिया, डिस्ग्राफिया, डिस्केल्कुलिया, डिस्प्रैक्सिया और विकासात्मक वाचाघात जैसी स्थितियां शामिल हैं;

(ख) "ऑटिज़्म स्पेक्ट्रम डिसऑर्डर" **से** एक न्यूरो-विकासात्मक स्थिति अभिप्रेत है जो आमतौर पर जीवन के पहले तीन वर्षों में दिखाई देती है जो किसी व्यक्ति की संवाद करने, रिश्तों को समझने और दूसरों से संबंधित होने की क्षमता को महत्वपूर्ण रूप से प्रभावित करती है, और अक्सर असामान्य या रूढ़िवादी अनुष्ठानों या व्यवहारों से जुड़ी होती है।

3. **मानसिक व्यवहार**, - "मानसिक बीमारी" **से** सोच, मनोदशा, धारणा, अभिविन्यास या स्मृति का एक बड़ा विकार अभिप्रेत है जो निर्णय, व्यवहार, वास्तविकता को पहचानने की क्षमता या जीवन की सामान्य मांगों को पूरा करने की क्षमता को गंभीर रूप से ख़राब करता है, लेकिन इसमें मंदता शामिल नहीं है जो किसी व्यक्ति के दिमाग के अवरुद्ध या अपूर्ण विकास की स्थिति है, जो विशेष रूप से बुद्धि की सामान्यता की विशेषता है।

4. **विकलांगता के कारण –**

(क) चिरकालिक न्यूरोलॉजिकल स्थितियां, जैसे-

(i) "बहुल ऊतक दृढ़न" से एक प्रदाहक, तंत्रिका तंत्र की बीमारी अभिप्रेत है जिसमें मस्तिष्क और रीढ़ की हड्डी की तंत्रिका कोशिकाओं के अक्षतंतु के चारों ओर मेरूमज्ज आच्छादन क्षतिग्रस्त हो जाते हैं, जिससे मस्तिष्क और रीढ़ की हड्डी में तंत्रिका कोशिकाओं की क्षमता नष्ट हो जाती है और एक दूसरे के साथ संवाद करना प्रभावित होती है।

(ii) "पार्किंसंस रोग" से तंत्रिका तंत्र की बढ़नेवाली बीमारी अभिप्रेत जो कंपकंपी, मांसपेशियों की कठोरता और धीमी, अनिश्चित गति से चिह्नित होती है, जो मुख्य रूप से मध्यम आयु वर्ग और बुजुर्ग लोगों को प्रभावित करती है जो मस्तिष्क के बेसल गैन्गिलया के पतन और न्यूरोट्रांसमीटर डोपामाइन की कमी से जुड़ी होती है।

(ख) रक्त विकार-

(i) "अधिरक्त स्राव" से एक वंशानुगत बीमारी अभिप्रेतत है, जो आमतौर पर केवल पुरुषों को प्रभावित करती है, लेकिन महिलाओं द्वारा उनके पुरुष बच्चों को प्रेषित होती है, जिसमें रक्त की सामान्य थक्के जमने की क्षमता की हानि या हानि होती है, जिससे कि मामूली घाव के कारण घातक रक्तस्राव हो सकता है;

(ii) "थैलेसीमिया" से वंशानुगत विकारों का एक समूह अभिप्रेत है जिसमें हीमोग्लोबिन की मात्रा कम या अनुपस्थित होती है।

(iii) "सिकल सेल रोग" से एक हेमोलिटिक विकार अभिप्रेत है जो क्रोनिक एनीमिया, दर्दनाक घटनाओं और संबंधित ऊतक और अंग क्षति के कारण विभिन्न जटिलताओं से होता है; "हेमोलिटिक" लाल रक्त कोशिकाओं की कोशिका झिल्ली के विनाश को संदर्भित करता है जिसके परिणामस्वरूप हीमोग्लोबिन निकलता है।

5. **एकाधिक विकलांगताएं** (उपर्युक्त निर्दिष्ट विकलांगताओं में से एक से अधिक) जिसमें बहरा अंधापन भी शामिल है, जिससे एक ऐसी स्थिति अभिप्रेत है जिसमें किसी व्यक्ति में सुनने और देखने की हानि का संयोजन हो सकता है, जिससे गंभीर संचार, विकासात्मक और शैक्षिक समस्याएं हो सकती हैं।

6. कोई अन्य श्रेणी जो केंद्र सरकार द्वारा अधिसूचित की जाए।

नोट: आरपीडब्ल्यूडी अधिनियम, 2016 की अनुसूची में किसी भी संशोधन के परिणामस्वरूप उपर्युक्त अनुबंध में संशोधन किया जाएगा।

अनुबंध-9

[धारा 4.8 देखें]

आधुनिक चिकित्सा में स्नातकोत्तर पाठ्यक्रमों में प्रवेश के संबंध में विकलांग व्यक्तियों के अधिकार अधिनियम, 2016 के अधीन "विशिष्ट विकलांगता" वाले छात्रों के प्रवेश के संबंध में दिशानिर्देश

नोट:

1. "विकलांगता प्रमाणपत्र" सामाजिक न्याय और अधिकारिता मंत्रालय [दिव्यांगजन सशक्तिकरण विभाग] द्वारा भारत के राजपत्र में अधिसूचित विकलांग व्यक्तियों के अधिकार नियम, 2017 के अनुसार जारी किया जाएगा [दिव्यांगजन सशक्तिकरण विभाग] 15 जून 2017।

2. किसी व्यक्ति में "निर्दिष्ट विकलांगता" की सीमा का मूल्यांकन "विकलांग व्यक्तियों के अधिकार अधिनियम, 2016 (2016 का 49) के अधीन शामिल किसी व्यक्ति में निर्दिष्ट विकलांगता की सीमा का आकलन करने के उद्देश्य से दिशानिर्देश" के अनुसार किया जाएगा। 4 जनवरी 2018 को सामाजिक न्याय और अधिकारिता मंत्रालय [विकलांग व्यक्तियों के सशक्तिकरण विभाग (दिव्यांगजन)] द्वारा भारत के राजपत्र में अधिसूचित किया गया।

3. निर्दिष्ट विकलांगता वाले व्यक्तियों के लिए आरक्षण का लाभ उठाने के लिए पात्र होने के लिए विकलांगता की न्यूनतम डिग्री 40% (बेंचमार्क विकलांगता) होनी चाहिए।

4. 'शारीरिक रूप से विकलांग' (पीएच) शब्द के स्थान पर 'विकलांग व्यक्ति' (पीडब्ल्यूडी) शब्द का उपयोग किया जाना है।

क्र.सं.	विकलांगता प्रकार	विकलांगता का प्रकार	निर्दिष्ट विकलांगता	विकलांगता सीमा		
				चिकित्सा पाठ्यक्रम के लिए पात्र, पीडब्ल्यूडी कोटा के लिए पात्र नहीं	चिकित्सा पाठ्यक्रम के लिए पात्र, पीडब्ल्यूडी कोटा के लिए पात्र	चिकित्सा पाठ्यक्रम के लिए पात्र नहीं
1.	शारीरिक अपंगता	**क. लोकोमोटर विकलांगता, जिसमें निर्दिष्ट विकलांगताएं (एक तक) शामिल हैं।**	क. कुष्ठ रोग से पीड़ित व्यक्ति* ख.सेरेब्रल पाल्सी** ग.बौनापन घ.मांसपेशीय दुर्विकास ङ.एसिड अटैकपीड़ित च. अन्य*** जैसे विच्छेदन, पोलियोमाइलाइटिस, आदि।	40% से कम विकलांगता	40-80% विकलांगता। 80% से अधिक विकलांगता वाले व्यक्तियों को भी मामले के आधार पर अनुमति दी जा सकती है और उनकी कार्यात्मक अर्हता सहायक उपकरणों की सहायता से निर्धारित की जाएगी, यदि इसका उपयोग किया जा रहा है, तो यह देखने के लिए कि क्या इसे 80% से नीचे लाया गया है और क्या उनके पास पाठ्यक्रम को संतोषजनक ढंग से आगे बढ़ाने और पूरा करने के लिए आवश्यक पर्याप्त मोटर क्षमता है।	80% प्रतिशत से अधिक
			*उंगलियों और हाथों में संवेदनाओं के नुकसान, विच्छेदन, साथ ही आंखों की भागीदारी और संबंधित सिफारिशों पर ध्यान दिया जाना चाहिए। ** दृष्टि, श्रवण, संज्ञानात्मक कार्य आदि की हानि पर ध्यान दिया जाना चाहिए और संबंधित अनुशंसाओं पर ध्यान दिया जाना चाहिए। ***दोनों हाथ अक्षुण्ण, अक्षुण्ण संवेदनाओं के साथ, पर्याप्त शक्ति और गति की सीमा को चिकित्सा पाठ्यक्रम के लिए पात्र माना जाना आवश्यक है।			
		ख. दृश्य हानि(*)	क.अंधत्व ख.कम दिखाई पड़ना	40% से कम विकलांगता	---	40% से अधिक विकलांगता के बराबर
		ग. श्रवण बाधित@	क.बहरा ख.सुनने में कठिनाई	40% से कम विकलांगता	---	40% विकलांगता के बराबर या उससे अधिक
			(*) 40% से अधिक की दृष्टि हानि/दृष्टि विकलांगता वाले व्यक्तियों को स्नातकोत्तर चिकित्सा शिक्षा प्राप्त करने के लिए पात्र बनाया जा सकता है और उन्हें आरक्षण दिया जा सकता है, बशर्ते कि दृष्टि विकलांगता को बेंचमार्क से कम के स्तर पर लाया जाए। 40% में से उन्नत निम्न दृष्टि सहायता जैसे दूरबीन/आवर्धक आदि के साथ। @40% से अधिक सुनने की अक्षमता वाले व्यक्तियों को स्नातकोत्तर चिकित्सा शिक्षा प्राप्त करने			

			के लिए पात्र बनाया जा सकता है और उन्हें आरक्षण दिया जा सकता है, बशर्ते कि सहायता प्रदत्त उपकरण की सहायता से श्रवण विकलांगता को 40% के बेंचमार्क से कम के स्तर पर लाया जाए। इसके अतिरिक्त, व्यक्ति का भाषण भेदभाव स्कोर 60% से अधिक होना चाहिए।			
		घ.वाणी और भाषा विकलांगता$	जैविक/न्यूरोलॉजिकल कारण	कम से कम 40% विकलांगता	-	40% विकलांगता के बराबर या उससे अधिक
		$ स्पीच इंटेलीजिबिलिटी प्रभावित (एसआईए) वाले व्यक्ति स्नातकोत्तर पाठ्यक्रम करने के लिए पात्र होंगे, बशर्ते स्पीच इंटेलीजिबिलिटी प्रभावित (एसआईए) स्कोर 3 (तीन) से अधिक नहीं होना चाहिए, जो कि 40% या उससे कम है। वाचाघात से पीड़ित व्यक्ति स्नातकोत्तर पाठ्यक्रम करने के लिए पात्र होंगे, बशर्ते वाचाघात भागफल (एक्यू) 40% या उससे कम हो।				
2.	बौद्धिक विकलांगता		क. विशिष्ट सीखने की विकलांगताएं (अवधारणात्मक विकलांगताएं, डिस्लेक्सिया, डिस्केल्कुलिया, डिस्प्रैक्सिया	वर्तमान में एसपी एलडी की गंभीरता का आकलन करने के लिए कोई मात्रा निर्धारण पैमाना उपलब्ध नहीं है, इसलिए 40% का कट-ऑफ मनमाना है और अधिक साक्ष्य की आवश्यकता है।		
				कम से कम 40% विकलांगता	40% विकलांगता के बराबर या उससे अधिक और 80% से कम। लेकिन चयन विशेषज्ञ पैनल द्वारा मध्यस्थता/सहायक प्रौद्योगिकी/सहायता/ बुनियादी ढांचे की मदद से मूल्यांकन की गई सीखने की अर्हता पर आधारित होगा।	80% से अधिक या गंभीर प्रकृति या महत्वपूर्ण संज्ञानात्मक/बौद्धिक विकलांगता
			ख. आत्मकेंद्रित स्पेक्ट्रम विकार	अनुपस्थिति या हल्की विकलांगता, गेर्सिंड्रोम के अनुसार (आईएसएए के अनुसार 60% तक की विकलांगता) जहां व्यक्ति एक विशेषज्ञ पैनल द्वारा स्नातकोत्तर पाठ्यक्रम के लिए उपयुक्त है	वर्तमान में मानसिक बीमारी की उपस्थिति और सीमा को स्थापित करने के उद्देश्यपूर्ण तरीके की कमी के कारण अनुशंसित नहीं है। हालांकि, विकलांगता मूल्यांकन के बेहतर तरीकों को विकसित करने के बाद भविष्य में आरक्षण/कोटा के लाभ पर विचार किया जा सकता है।	60% से अधिक विकलांगता या संज्ञानात्मक/बौद्धिक विकलांगता की उपस्थिति और/या यदि व्यक्ति विशेषज्ञ पैनल द्वारा स्नातकोत्तर पाठ्यक्रम करने के लिए अयोग्य है
3.	**मानसिक व्यवहार**		मानसिक बिमारी	अनुपस्थिति या हल्की विकलांगता: 40% से कम (आईडीईएएस के अधीन)	वर्तमान में मानसिक बीमारी की उपस्थिति और सीमा को स्थापित करने के उद्देश्यपूर्ण तरीके की कमी के कारण अनुशंसित नहीं है। हालांकि, विकलांगता मूल्यांकन के बेहतर तरीकों को विकसित करने के बाद भविष्य में आरक्षण/कोटा के लाभ	एनईएक्सटी/नीट-पीजी में पात्र होने पर किसी भी मानसिक विकार को पीजी चिकित्सा शिक्षा प्राप्त करने से रोका नहीं जाता है

					पर विचार किया जा सकता है।	
4.	विकलांगता के कारण	**क. क्रोनिक न्यूरोलॉजिकल स्थितियाँ**	i. मल्टीपलस्क्लेरोसिस	कम से कम 40% विकलांगता	40-80% विकलांगता	80% से अधिक
			ii. पार्किंसनिज़्म			
		ब. रक्त विकार	i. हीमोफीलिया	कम से कम 40% विकलांगता	40-80% विकलांगता	80% से अधिक
			ii. थैलेसीमिया			
			iii. सिकल सेल रोग			
5.	बधिर-अंधता सहित अनेक विकलांगताएं		उपर्युक्त निर्दिष्ट विकलांगताओं में से एक से अधिक	व्यक्तिगत मामलों में उपर्युक्त में से किसी की उपस्थिति, अर्थात् दृश्य, श्रवण, भाषण के संबंध में सिफारिशों पर निर्णय लेते समय उपर्युक्त सभी पर विचार करना चाहिए। भारत सरकार द्वारा जारी संबंधित राजपत्र अधिसूचना द्वारा अधिसूचित संयोजन सूत्र। $a + \left[\frac{b\,(90-a)}{90}\right]$ (जहां क.= विकलांगता% का उच्च मूल्य और ख.= विभिन्न विकलांगताओं% के लिए गणना की गई विकलांगता का कम मूल्य) किसी व्यक्ति में एक से अधिक अक्षमता की स्थिति मौजूद होने पर उत्पन्न होने वाली विकलांगता की गणना करने के लिए इसकी सिफारिश की जाती है। इस सूत्र का उपयोग एकाधिक विकलांगता वाले मामलों में किया जा सकता है, और प्रवेश और/या आरक्षण के संबंध में सिफारिशें व्यक्तिगत रूप से दी गई विशिष्ट विकलांगताओं के अनुसार की जाती हैं।		

NATIONAL MEDICAL COMMISSION

NOTIFICATION

New Delhi, the 29th December, 2023

F. No. CDN-19012/5/2023-Coord-NMC.—In exercise of overall powers conferred by the National Medical Commission Act, 2019 *vis-à-vis* medical education in general and specifically by sub-section (1) of Section 25, sub-section (2) of Section 57 and Section 35 of the said Act, National Medical Commission makes the following Regulations namely –

Short title – These Regulations may be called the "Post-Graduate Medical Education Regulations, 2023" or "PGMER-23" in its abbreviated form.

Commencement – These Regulations shall come into force from the date of their publication in the official gazette. Provided the National Medical Commission may publish different dates for different Regulations stated hereunder.

CHAPTER I

PRELIMINARY

1.1 Focus and Goal

The focus and goal of post-graduate medical education shall be to produce competent specialist and medical teachers recognised by the fraternity as the graduating scholars, building upon their undergraduate education and skills who shall –

i. Recognise the health needs of the community and carry out professional obligations ethically keeping in view the objectives of the national health policy;

ii. Have mastered most of the competencies, pertaining to the respective speciality, that is required to be practised at the secondary and the tertiary levels of the health care delivery system;

iii. Be aware of the contemporary advancements and developments in the respective discipline concerned and shall progress accordingly;

iv. Have acquired a spirit of scientific inquiry and is oriented to the principles of research methodology and epidemiology;

v. Have acquired the basic skills in the teaching of medical and paramedical professionals;

vi. Acquire basic management skills in human resources, materials and resource management related to health care delivery, general hospital management, principal inventory skills and counselling;

vii. Develop personal characteristics and attitudes required for professional life such as personal integrity, sense of responsibility and dependability and ability to relate to or show concern for other individuals;

viii. Become an exemplary citizen by observing the highest standards of professional ethics and working towards fulfilling social and professional obligations to respond to national aspirations.

The institutions imparting post-graduate medical education shall continually work to synchronize the institutional goals with the national goals to produce the kind of trained manpower with high knowledge, appropriate skills and impeccable ethical standards required.

1.2 Definitions – In these Regulations, unless the context otherwise requires the terms defined herein shall bear the meaning assigned to them below and their cognate expressions and variations shall be construed accordingly –

a. **"Act"** shall mean National Medical Commission Act, 2019 [Act No. 30 of 2019].

b. **"Commission"** shall mean the National Medical Commission duly established under Section 3 of the National Medical Commission Act, 2019.

c. **"Medical Institution"** shall mean *'Medical Institution'* as defined in Section 2(i) of the National Medical Commission Act, 2019; and shall include a common expression medical college as well.

d. **"PGMEB"** shall mean Post-Graduate Medical Education Board duly constituted under Section-16 of National Medical Commission Act, 2019.

e. **"UGMEB"** shall mean Under-Graduate Medical Education Board duly constituted under Section-16 of National Medical Commission Act, 2019.

f. **"MSR"** shall mean the Minimum Standards of Requirements as notified either by UGMEB or PGMEB as the case may be from time to time which shall also include explanatory notes, circulars, advisories etc. issued by the corresponding boards or the commission.

g. **"NEET-PG"** shall mean National Eligibility-cum-Entrance Test for admission in broad-speciality courses.

h. **"NEET-SS"** shall mean "National Eligibility-cum-Entrance Test" for super- speciality courses as referred to under Section 14 of the National Medical Commission Act, 2019.

i. **"NExT"** shall mean the common final year examination or National Exit Test as referred to under Section 15 of the National Medical Commission Act, 2019.

j. **"University"** shall mean the Health University as defined under Sub-Section (f) of Section 2 or a University as defined under sub-section (x) of Section 2; both under the National Medical Commission Act, 2019, as the case may be.

k. **"Feeder Speciality"** shall mean broad-speciality qualification required to pursue course of qualification.

CHAPTER II

LIST OF QUALIFICATIONS AND DURATION OF THE COURSES

2.1 List of qualifications, duration of the course and components of Post-graduate Training shall be as indicated below:

S.No.	Name of Qualification	Duration of Course (including period of examination)
i.	Post-graduate broad-speciality Qualifications **(Annexure-1)**	3 Years/ 2 years*
ii.	Post-graduate super-speciality Courses **(Annexure-2)**	3 Years
iii.	Post-graduate diploma Courses **(Annexure-3) @**	2 Years
iv.	Post-Doctoral Certificate Courses (PDCC) **(Annexure-4)**	1 year
v.	Post-Doctoral Fellowship (PDF) Courses **(Annexure-5)**	2 years
vi.	D.M./M.Ch. (6 years Course) **(Annexure-6)**	6 years

* The period of training, including the period of examination, shall be two years for the students, who possess a recognized two-year post-graduate diploma course in the same subject.

@ Medical colleges/institutions may apply to Medical Assessment and Rating Board (MARB) for converting diploma seats to degree seats. No more new applications will be entertained for permission to start or increase in number of diploma seats.

CHAPTER III

ESTABLISHMENT OF POST-GRADUATE MEDICAL INSTITUTIONS, STARTING OF NEW POST-GRADUATE MEDICAL COURSES AND MAINTENANCE OF STANDARD OF MEDICAL EDUCATION

3.1 Permission and Recognition

i. No Medical Institution shall start any post-graduate course unless granted permission from the National Medical Commission or such Board or Boards as indicated by the National Medical Commission.

ii. Without prejudice to sub-section (i) above, permission to start the post-graduate course in a medical college/institution running the undergraduate course and determination of number of seats to be permitted shall be as per the Establishment of New Medical Institutions, Starting of New Medical Courses, Increase of Seats for Existing Courses and Assessment and Rating Regulations,2023, Post-Graduate Medical Education Regulations, 2023, Teachers Eligibility Qualifications in Medical Institutions Regulations,2022, MSR(s) notified by UGMEB and PGMEB, Curriculum requirements of respective Speciality as notified/informed from time to time on website or by other methods by Post-Graduate Medical Education Board (PGMEB), other relevant regulations, explanatory notes, circulars and advisories etc., issued from time to time.

The medical college/institution will be permitted to start the post-graduate courses if it fulfils all the requirements for running the existing undergraduate course. The medical college/institution can apply for starting the post-graduate course(s) one year after the medical college/institution has been permitted to start an undergraduate course (i.e. during the second year of the undergraduate course).

iii. Existing or proposed non-teaching hospitals owned and managed by government can start post-graduate courses without having undergraduate college, provided they fulfil the norms and procedures prescribed in the Establishment of New Medical Institution, Starting of New Medical Courses, Increase of Seats for Existing Courses and Assessment and Rating Regulations,2023, Post-Graduate Medical Education Regulations, 2023, Teachers Eligibility Qualifications in Medical Institutions Regulations, 2022, MSR notified by PGMEB (PGMSR-23), Curriculum requirements of respective Speciality as notified/informed from time to time on website or by other methods by Post-Graduate Medical Education Board (PGMEB), other relevant regulations, explanatory notes, circulars and advisories etc., issued from time to time.

iv. Once permitted, the course for the qualification will be considered recognised and seats permitted will be considered as recognised seats for registration of the degree awarded. Medical colleges/Institutions running such courses will be considered as Accredited Medical colleges/Institutions for the said course of qualification.

3.2 Increase of Seats

Procedures, methods and criteria for increase of seats will be the same as prescribed in **sub-section 3.1** above**.**

Provided an increase of seats so granted in already Recognised (Accredited) post-graduate courses shall be deemed to be recognized post-graduate seats for the purpose of registration of the students.

3.3 MONITORING OF STANDARDS OF MEDICAL EDUCATION

The standards of the Medical Education shall be monitored as per the Maintenance of Standards of Medical Education Regulations, 2023. Medical college/institution shall pay Annual Fee, as may be prescribed by the National Medical Commission from time to time, for the purpose of annual evaluation and affiliation etc. PGMEB may also conduct assessments of medical colleges/institutions at regular intervals or randomly as it desires to increase the standard of their offerings.

3.4 MINIMUM STANDARDS OF REQUIREMENTS (MSR)

Medical institution shall satisfy the conditions pertaining to but not limited to physical infrastructure, teaching staff, clinical material and hospital as detailed in the MSR document for post-graduate medical education. This document will be called as PGMSR-2023 and will be notified by the PGMEB. The PGMEB shall also notify the modifications or amendments in the MSR from time to time, which shall have to be mandatorily followed by the medical colleges/institutions

CHAPTER IV

ADMISSION, COUNSELLING, ETC.

4.1 Eligibility Criteria –

Eligibility to pursue a post-graduate broad-speciality course in Medicine shall be as per "NMC, National Exit Test Regulations, 2023".

Provided that until the first batch based on National Exit Test (NExT) becomes eligible for admission in broad-speciality courses, the existing system of admission through National Eligibility-cum-Entrance Test-Post-graduate (NEET-PG) as per Post-Graduate Medical Education Regulation, 2000 (PGMER-2000) shall continue.

Without prejudice to anything stated above the Post-Graduate Medical Education Board may determine the manner, modalities etc., of conducting the NEET-PG for broad- speciality courses by way of Notification.

Provided further that eligibility to pursue a super-speciality programme/course in Medicine shall be by securing the minimum eligible score at the National Eligibility-cum-Entrance Test-Super-Speciality (NEET-SS) conducted either by the National Medical Commission or caused to have been conducted by the National Medical Commission. The list of feeder broad Speciality qualifications required to pursue a super-speciality course of recognised super-speciality qualification is as per **Annexure-7**.

An all-India merit list as well as a State-wise merit list of the eligible candidates shall be prepared based on the marks obtained in NExT or NEET-PG and candidates shall be admitted to post-graduate courses from the said merit lists only.

4.2 Conduct of NEET-SS – Either the National Medical Commission may conduct the NEET-SS for all or any few super-speciality courses or may designate any such agency or authority to cause the NEET-SS to be conducted.

Provided National Medical Commission may designate multiple agencies or authorities or a combination of agencies or authorities, to conduct NEET-SS if such designation suits the purpose.

Without prejudice to anything stated above the Post-Graduate Medical Education Board shall determine the manner, modalities, etc., of conducting the NEET-SS for super- speciality courses by way of notification.

4.3 Common Counselling – Without prejudice to anything stated in the present Regulations or other NMC Regulations, there shall be common counselling for admission to post-graduate courses in medicine for all medical institutions in India solely based on the merit list of respective exams.

Provided the common counselling may have multiple rounds as may be necessary.

All rounds of counselling for all seats will be held on online mode by state or central counselling authority and no medical college/ institution will admit any candidate themselves.

While entering details in seat matrix, medical colleges shall mention the amount of fees for each course, failing which seat will not be counted.

PGMEB of NMC shall publish guidelines and time schedule for the conduct of examination, common counselling, admission, joining and commencement of academic session; and the designated authority under **Section 4.4** shall conduct common counselling in conformity with such published guidelines and time schedule.

4.4 Government to Appoint a Designated Authority for Common Counselling – For admission to broad-speciality post-graduate courses in medicine in medical institutions, the Central Government or its designated authority shall be the counselling agency for the All-India quota seats and the concerned State Government/U.T. administration shall be the counselling agency for the respective State/Union Territory quota of seats. For all the seats in the super-speciality courses, the Central Government or its designated authority shall be the counselling agency.

4.5 Prohibition for any Student Seeking Admission in any other way than Counselling – No medical institution shall admit any candidate to the Post-Graduate Medical Education courses (including super-speciality medical courses) in contravention of these regulations.

Provided the medical institution granting admission to any student in contravention of these Regulations, shall be fined rupees one crore per seat for non-compliance. For any subsequent non-compliance or continued contravention, the medical institution shall be barred from granting admissions to any student in the subject for minimum two academic years from the next academic year.

Provided further that such Student admitted in contravention of this mandate shall be discharged from the Medical College and double the number of seats shall be reduced for one or more years.

4.6 Submission of the Final List – The respective designated authorities (who have conducted the Common Counselling) shall submit the final list of students in the prescribed form to the Post-graduate Medical Education Board within one week of the completion of the common counselling, which in turn shall publish that list in the NMC website. Provided each institution shall also submit the final list of students admitted, in the prescribed form to the PGMEB within one week of the last date of the joining course, declared by the PGMEB.

Provided only those medical institutions that were permitted to start the post-graduate medical course prior to the date of notification of Common Counselling are allowed to admit students; and those medical institutions, who get requisite permission after the date of notification of Common Counselling shall participate in the next academic year's common counselling to admit students.

Explanation: Requisite permission shall also apply *mutatis mutandis* for increase of seat strength in medical institutions already established.

4.7 Student Migration – No student finally designated to a medical institution, notwithstanding anything stated in these Regulations, shall be permitted migration to any other medical institution.

4.8 Reservation of Seats - The reservation of seats in medical colleges/institutions for respective categories shall be as per applicable laws prevailing in States/Union Territories.

Provided further that 5% seats of annual sanctioned intake capacity in Government or government-aided higher educational institutions shall be filled up by candidates with benchmark disabilities by the provisions of the Rights of Persons with Disabilities Act, 2016 based on the merit list of NExT or NEET-PG for admission to post-graduate medical courses. For this purpose, the "Specified Disability" contained in the Schedule to the Rights of Persons with Disabilities Act, 2016 is annexed at **Annexure-8** and the eligibility of candidates to pursue a course in medicine with a specified disability shall be in accordance with **Annexure-9**. If the seats reserved for the persons with disabilities in a particular category remain unfilled on account of unavailability of candidates, the seats should be included in the annual sanctioned seats for the respective category.

4.9 Feeder Broad Speciality Qualifications for Super Speciality Courses – The prior requirement of broad-speciality degree qualification to pursue super-speciality course for qualification will be called the Feeder Course.

CHAPTER V

TRAINING, ETC.

5.1 Period of Training

The period of training for the award of various post-graduate degrees and diplomas shall be as per **Chapter-II.**

5.2 Training Programme

(i) Post-graduate training shall consist of training of the students through lectures, seminars, journal clubs, group discussions, participation in laboratory and experimental work, involvement in research, clinical meetings, grand rounds, clinicopathological conferences, practical training in the diagnosis and medical and surgical treatment, training in the basic medical sciences as well as in allied clinical specialties, etc. as per the requirement of Speciality training.

Specialities where patient treatment is involved the teaching and training of the students, shall include graded responsibility in the management and treatment of patients entrusted to their care.

(ii) All post-graduate students will work as full-time resident doctors. They will work for reasonable working hours and will be provided reasonable time for rest in a day.

(iii) All broad-speciality and super-speciality students will do thesis related research and will write thesis.

(iv) Every institution undertaking post-graduate training programme shall set up an Academic Cell, under the Chairmanship of a senior faculty member, who shall monitor the implementation of training programmes in each speciality and ensure its quality as mandated by the PGMEB.

(v) The training programmes shall be updated as and when required while keeping in mind the curriculum requirements and other relevant requirements prescribed by PGMEB from time to time. The structured training programme shall be written and strictly followed, to enable the examiners to determine the training undergone by the candidates.

(vi) Post-graduate students of broad and super Speciality degree courses shall maintain a dynamic e-log book which needs to be updated on a weekly basis about the work being carried out by them and the training programme undergone during the period of training. Provided that M.S. /M.Ch students shall mandatorily enter details of surgical procedures assisted or done independently.

(vii) It shall be the duty of the Post-graduate guide imparting the training to assess and authenticate monthly the record (e-Log) books.

(viii) The post-graduate students shall essentially be required to participate in the teaching and training programme of undergraduate students and interns.

(ix) During the training for award of Degree/Diploma, there shall be proper training in basic medical sciences related to the disciplines concerned. During the training programmes emphasis has to be laid on preventive and social aspects. All post-graduate medical college/institution shall have facilities for teaching the basic science subjects as per guidelines.

(x) A post-graduate student of a degree course in broad specialty/super specialty will do at least one of the following to make him/her eligible to appear in his/her final examination:

a. Poster presentation at a National/Zonal/State conference of his/her speciality;

b. Podium presentation at a National/Zonal/State conference of his/her speciality;

c. Have one research paper published/accepted for publication in journal of his/her speciality as first author

(xi) Course in Research Methodology

a. All post-graduate students shall complete an online course in Research Methodology.

b. The students shall have to register on the portal of the designated training institutions.

c. The students are expected to complete the course in the first year.

d. The online certificate generated on successful completion of the course and examination thereafter, will be acceptable evidence of having completed this course.

e. The above certification shall be a mandatory requirement to be eligible to appear for the final examination of the respective post-graduate course.

f. This requirement shall be applicable for all post-graduate students.

(xii) Course in Ethics

a. All post-graduate students shall complete course in ethics including Good Clinical Practices and Good Laboratory Practices, whichever is relevant to them, to be conducted by institutions/Universities.

b. The students are expected to complete the course in the first year.

c. No post-graduate student shall be permitted to appear in the examination without the above certification.

(xiii) Course in Cardiac Life Support Skills

a. All post-graduate students shall complete a course in Basic Cardiac Life Support (BCLS) and Advanced Cardiac Life Support (ACLS) skills to be conducted by the institution.

b. The students are expected to complete the course in the first year.

c. No post-graduate student shall be permitted to appear in the examination without the above certification.

(xiv) Others - Institutions may arrange training in any other courses like awareness in medical audit, medical law, exposure to human behaviour studies, finance, accounts, etc, which are beneficial to the post-graduate students.

(xv) DISTRICT RESIDENCY PROGRAMME (DRP)

I . Preamble: Doctors have to be trained in diverse settings including those which are close to the community. Hence, they should be trained in the District Health System / the District Hospitals.

Provided that in respect of M.D./M.S. students admitted with effect from academic session 2021, the training imparted as part of the District Residency Programme, shall be considered as training imparted in a medical institution.

II. Objectives: The main objectives of the District Residency Programme (DRP) would be:

a. To expose the post-graduate student to the District Health System/ District Hospital and involve them in health care services being provided by District Health System /District Hospital for learning while serving;

b. To acquaint them with the planning, implementation, monitoring, and assessment of outcomes of the National Health programmes at the district level.

c. To orient them to promotive, preventive, curative and rehabilitative services being provided by various categories of healthcare professionals under the umbrella of the National Health Mission.

In doing so, the post-graduate medical students would also be contributing towards strengthening of services of the District Health System as Speciality resident doctors working as members of the districtteams.

III. Definition of District Hospital: For the purpose of this programme, a District Hospital shall be a functional public sector/government-funded hospital of not less than 50 beds with facilities/staff for the

designated specialties at that level/facility. Any post-graduate medical institution or a super-speciality hospital will not be considered as district hospital.

IV. Definition of District Health System: For the purpose of this programme, the District Health System shall include all public sector/government-funded hospitals and facilities (including community health centres, primary health centres, sub-health centres, urban health centres, etc.), as well as community outreach system in a district. This would also include district system engaged in running respective public health services including the implementation of national and state public health programmes.

V. District Residency Programme: All post-graduate students pursuing M.D./M.S. in broad specialties in all medicalcolleges/institutions under the purview of the National Medical Commission shall undergo a compulsory residential rotation of three months in District Hospitals/ District Health System as a part of the course curriculum. Such rotation shall take place in the 3rd or 4th or 5th semester of the post-graduate programme. In the case of those students who have taken admission after completion of the Diploma in the relevant Speciality, the District Residency Programme shall take place in the third semester only. Similarly, the post-graduate diploma students shall undergo the District Residency Programme in the third semester.

This rotation shall be termed as 'District Residency Programme' (DRP) and the post-graduate medical student undergoing trainingshall be termed as a 'District Resident'.

VI. Training and Responsibilities of District Residents: The District Resident will work under the overall directions and supervision of the District Residency Programme Coordinator (DRPC).

During this rotation, the Resident doctor will be posted with the concerned/allied Speciality team/unit/ sections/services at the District Health System/ District Hospital.-The clinical responsibilities assigned to the Residents would include serving in outpatient, inpatient, casualty, and other areas pertaining to their Speciality and encompass night duties.

Post-graduate students of specialities where direct patient care is not involved will be trained by District Health System/ District Hospital teams within the available avenues in coordination with the District Health Officer/Chief Medical Officer. They would be trained in and contribute to the diagnostic/laboratory services, pharmacy services, forensic services, general clinical duties, managerial roles, public health programmes etc., as applicable. They may also be posted in research units / facilities, laboratories and field sites of the Indian Council of Medical Research and other national research organizations.

VII. Stipend and Leave for District Residents: The District Residents shall continue to draw full stipend from their respective medical colleges for the duration of the rotation subject to the attendance record submitted by the appropriate district authorities to the parent medical college/institution, based on methods and system as prescribed. Subject to exigencies of work, the District Resident will be allowed one weekly holiday by rotation. They shall also be entitled to leave benefits as per the rules/ guidelines of the parent college/university.

VIII. Training during DRP and Certification thereof:

a. Quality of training shall be monitored by log books, supportive supervision, and continuous assessment of performance. The attendance and performance of District Residents shall be tracked by the District Residency Programme Coordinator (DRPC) of the district concerned, as well as the parent Medical College through an appropriate electronic/digital or mobile enabled system. Such monitoring systems shall also be accessible to the State/Union Territory Steering Committee and the National Coordination Cell.

b. The District Residents would remain in contact with their designated post-graduate teachers and departments at their parent Medical College / Institution by phone and e-communication for guidance, learning, and for being able to participate remotely in scheduled case discussions, seminars, journal clubs, thesis discussion, etc. and other academic activities.

c. Satisfactory completion of the District Residency shall be an essential condition before the candidate is allowed to appear in the final examinationof the respective post-graduate course.

d. The District Residency Programme Coordinator (DRPC) shall issue certificate of satisfactory completion of DRP and report on the performance of the District Resident on a prescribed format to be decided by the PGMEB to the concerned medical college and the Govt. of the State/UT.

IX. Responsibility of Medical College/Medical Institution: It shall be incumbent upon all medical colleges/ institutions to place the post-graduate students at the disposal of the Government of concerned State/Union Territory for the District Residency Programme. The faculty of the concerned departments

would provide guidance to the District Residents by phone/e-communication in accordance with **Section 5.2.VI and VIII**.

X. Responsibility of State Government /Union Territory: The State Government /Union Territory shall implement the District Residency Programme within their jurisdiction as under: -

a. The Programme shall be coordinated jointly by the Directorate of Medical Education and the Directorate of Health Services. An Officer of the State Government /Union Territory shall be designated as the State/UT District Residency Programme (DRP) Nodal Officer. The concerned Government shall be responsible for the facilitation, oversight and supervision of the District Residency Programme.

b. The designated State/UT DRP Nodal officer shall identify and designate District Health System/ District Hospital that are suitable for such rotation in terms of availability of specific specialties, specialists, facilities and services available in consultation with the Directorate of Health Services of the State and the medical colleges, and develop a placement schedule of the Post-graduate residents of the medical colleges due for rotation at least six months in advance. This official will also be responsible for grievance redressal atState level.

c. The State DRP Nodal officer shall undertake rule-based allotment of the training facilities to the Post-graduate Residents.

d. The State Government shall provide appropriate amenities to the District Residents, including, amongst others, suitable accommodation, mess, transportation to work place (if living quarters is far away), security, especially for lady Residents. Accommodation could be by means of Government premises or that rented by concerned State Government and should conform to prescribed norms.

e. The District Residents shall remain under the jurisdiction of respective State/ UT DRP Nodal officer where they are undergoing District Residency.

f. In case all the Post-graduate Residents of a State/UT cannot be absorbed within their respective jurisdiction, possibility of posting them to other States/Union Territories may be explored by mutual understanding in consultation with the respective Governments facilitated by the National Coordination Cell.

g. It shall be permissible for the post-graduate students from the North East Zone (NEZ) in various medical colleges/institutions in the country, to undergo District Residency Programme in their respective States.

h. The State Government/UT may consider providing additional honorarium to the District Residents as a token of recognition of their contribution to the healthcare services of the States. In addition, the concerned Governments may make provisions to incentivize postings to remote and difficult areas, and encourage volunteering by post-graduate students to serve at these places.

i. The concerned State Government shall also designate a senior official of the District Health System as the District Residency Programme Coordinator (DRPC) in each District for coordinating between the State DRP Nodal officer and the medical colleges. The District Residency Programme Coordinator shall also be responsible for orienting the Post-graduate Residents to the District health system, supervising the postings within the district, ensuring their accommodation, safety and transport needs, grievance redressal, etc. District Residency Programme Coordinator shall be the competent authority for sanctioning leave to District Residents.

XI. Responsibility of National Medical Commission: All Medical institutions will submit the DRP posting details of the students to PGMEB of the National Medical Commission within one week of completion of the DRP. The PGMEB of the National Medical Commission will monitor the training programme and may direct necessary changes to the State Government and Medical institutions, if so desired.

XII. Constitution of National/State Oversight Mechanisms:

a. The National Medical Commission shall constitute a National Steering Committee in consultation with the Ministry of Health and Family Welfare, Government of India to oversee the implementation of the District Residency Programme.

b. The National Steering Committee shall be chaired by the President, Post-Graduate Medical Education Board (PGMEB) or his nominee. The Committee shall comprise nominated members from the Ministry of Health and Family Welfare (not below the rank of Director/Deputy Secretary), Nominee of the Directorate General of Health Services (DGHS) and representatives of at least six State

Governments/Union Territories. The Committee may submit quarterly reports to the Central Government.

c. The National Steering Committee shall establish a National Coordination Cell (NCC) under the PGMEB of the National Medical Commission, which shall be responsible for the smooth and efficient implementation of the District Residency Programme and grievance redressal at the national level.

d. The Governments of State/Union Territory shall constitute a State/UnionTerritory level Steering Committee chaired by the Principal Secretary/ Secretary (Health) and comprising the Principal Secretary/Secretary (Medical Education), Director of Health Services, Director of Medical Education, Registrar of the Health University and Deans of the medical colleges to facilitate the implementation of the District Residency Programme.

XIII. Application for Proportionate Enhancement of Postgraduate Seats: The Medical College/Institution may apply for proportionate enhancement of MD/MS seats to compensate for the potential compromise of work at its teaching hospital/institution due to out-posting of the postgraduate medical students/residents for the District Residency Programme. Such applications can be made after one year of the implementation of the District Residency Programme.

XIV. Launch of the District Residency Programme: The District Residency Programme shall be implemented with the post-graduate broad-speciality batch that has joined the post-graduate course in the Academic Session 2021.

5.3 Curriculum: The Post-graduate Medical Education Board shall publish the model curriculum and the outcome objectives of the same from time to time on the NMC website, which shall be implemented by the colleges/institutions.

5.4 Stipend to Post-graduate Students: The post-graduate students undergoing post-graduate Degree/Diploma/Super-speciality courses in all the institutions shall be paid a stipend at par with the stipend being paid to the post-graduate students of State Government medical institutions/Central Government medical institutions, in the State/Union Territory where the institution is located.

5.5 Leave Rules for Post-graduate Students - The following leave rules will be followed:

a. Every post-graduate student will be given minimum 20 days of paid leave (casual leave) per year.

b. Subject to exigencies of work, post-graduate students will be allowed one weekly holiday.

c. Female post-graduate students shall be allowed maternity leave as per existing Government rules and regulations.

d. Male post-graduate students shall be allowed paternity leave as per existing Government rules and regulations.

e. In addition to 20 days' paid leave, the candidates will be allowed academic paid leave of 5 days per year.

The training period shall be as per **Chapter-II.** If candidate avails leave in excess of the permitted number of days, his/her term of course shall be extended by the same number of days to complete the training period. However, one shall be able to appear in the examination if one has 80% (eighty per cent) of the attendance.

5.6 Accommodation for Post-graduate Students: It will be mandatory for the college to provide appropriate residential accommodation to post-graduate students. However, it will not be mandatory for the post-graduate students to stay in the hostel.

CHAPTER VI

ROLE OF UNIVERSITIES

6.1 It shall be the duty of all concerned Universities with the medical institutions under them, to partner with the National Medical Commission –

a. To implement an appropriate curriculum to provide high-quality and affordable post-graduate medical education to the student to make him a competent specialist and/or medical teacher.

b. To provide training in clinical and practical skills along with theoretical knowledge, laying emphasis upon attitude, ethics and communication skills to ensure imparting competency-based medical education.

c. Encourage scholars in both self-directed and assisted learning.

d. Provide periodic and transparent assessment of medical education being imparted by Medical Institutions to meet with highest global standards.

e. Provide a summative assessment for overall successful completion of the post-graduate programme.

f. Inspire confidence in the students to handle emergencies and calamities at all levels.

6.2 Without prejudice to the above, the concerned University and medical institutions under them shall ensure that proper records of the work be maintained so that they form the basis of objective, efficient and transparent internal assessment of scholars.

Provided further that, these maintained and well-classified documents shall be made available for consultation at all times, particularly for the purposes of assessment of the medical college either by the concerned University or NMC.

6.3 It shall be the constant endeavour of the concerned University to constantly develop strategies for optimal utilization of evolving technology by the faculty, medical education department and scholars during the period of training at the post-graduation level.

6.4 It shall be the constant endeavour of the concerned University to maximize the use of digital technology for conducting examinations and issuance of Degrees/Diploma and other certificates in digital mode which should be available on the Digi locker platform. All the Universities should make all-out efforts to start the issuance of Certificates in digital mode on the Digi locker platform as early as possible.

CHAPTER VII

DEPARTMENT, UNITS, FACULTY AND SENIOR RESIDENTS

7.1 Department: The name of the Department will be as per the name of the Speciality subject (qualification) (**Annexure-1, Annexure-2**). Each Department will be headed by a Professor.

Unit: All Departments with inpatient beds will have unit structure (Units), if applicable.

Faculty: Professor, Associate Professor and Assistant Professor will be considered as faculty and they will be full time. Appointment and promotion of faculty in various teaching Specialities imparting post-graduate medical education in medical institutions, falling within the purview of the National Medical Commission, has to be in accordance with the norms of Teachers Eligibility Qualifications in Medical Institutions Regulations, 2022. The number of faculty requirement and the number of post-graduate students registrable under each faculty will be as per Post-Graduate Medical Education Regulations, 2023 and PGMSR-23.

In Government institutions, where faculty holding post of Additional Professor fulfilling all the requirements to become Professor will be considered as Professor for all purposes. Similarly, in Government institutions, where faculty holding post of Reader, fulfilling all the requirements to become Associate Professor will be considered as Associate Professor for all purposes.

Senior Residents and Junior Residents: Senior Resident shall have post-graduate degree qualification in the respective broad- speciality. Post-graduate students pursuing super-speciality courses will also be called as senior residents. Students pursuing broad-speciality courses will be called as junior residents.

Post-graduate courses under any other body like the National Board of Examinations in Medical Sciences (NBEMS), etc. are not permissible against the very same units, teaching personnel and infrastructure for courses under these regulations.

7.2 The faculty of a medical college/institution shall assist the National Medical Commission/ Boards whenever required for the purpose of assessment and as experts, etc.

7.3 The position of Dean/Director/Principal of Medical College/Institution should be held by a person possessing recognised post-graduate medical degree from a recognised/accredited institution with a minimum of ten years teaching experience as Professor/Associate Professor in a Medical College/ Institution, out of which at least five years should be as Professor in the Department. Appointment to these posts shall be made on seniority-cum-merit basis. The Dean/Director/Principal of Medical Institution shall not hold the post of Head of the Department.

7.4 The Medical Superintendent of the affiliated teaching hospital shall possess a recognised post-graduate medical degree from a recognised/accredited institution with a minimum of ten years teaching experience as Professor /Associate Professor in the relevant departments of the Hospital, out of which at least five years should be as Professor. Appointment to these posts shall be made on seniority-cum-merit basis. Medical Superintendent shall not occupy the position of the Head of the Department. However, he can head the unit.

CHAPTER VIII

EXAMINATIONS

8.1 Examinations: The medical college/institution will conduct the Formative Assessment (examination) and the University will conduct the Summative Assessment (examination).

Both Formative Assessment (examination) and Summative Assessment (examination). shall consist of Theory, Clinical/Practical and Viva Voce.

The university shall conduct not more than two examinations in a year, for any subject, with an interval of not less than 4 and not more than 8 months betweenthe two examinations.

8.2 Examiners:

a. The examiner (both internal and external) for the post-graduate examination in Broad and Super Specialties shall have three years' experience as recognised Post-graduate Guide in the concerned subject.

b. The minimum number of examiners for post-graduate examination shall be four. Out of which, at least two shall be external examiners and least one of them shall be from different university outside the state.

c. An examiner shall not be appointed for more than two consecutive regular examinations for the same institution.

8.3 Methodology

A. Broad Specialties: Doctor of Medicine (M.D.)/Master of Surgery (M.S.): M.D./M.S. examinations, in any subject shall consist of theory papers, andclinical/practical and viva voce examinations.

a. Theory: The theory examination (both formative and summative) may be of descriptive answer of a question type, Multiple Choice Question (MCQ) type or mix of both types. Theory examination for summative examination shall be of four theory papers. The first and the fourth paper shall be on basic medical science and recent advances, respectively.

The theory examination shall be held well in advance before the clinical and practical examination.

b. Clinical/Practical and viva voce

i. Clinical examination for the subjects in clinical sciences shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a consultant/specialist/teacher, for which candidates shall be examined for one long case and two short cases.

ii. Practical examination for other subjects shall be conducted to test the knowledge and competence of the candidates for making valid and relevant observations based on the experimental/ laboratory studies and his ability to perform such studies as are relevant to his subject.

iii. The viva voce examination shall be thorough and shall aim at assessing the candidate's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the Speciality.

iv. Clinical/practical examination shall include Objective Structured Clinical Examination (OSCE).

B. Super Specialties: Doctorate of Medicine (D.M.)/Master of Chirurgie (M.Ch.): The Examination consists of theory and clinical/practical and viva voce.

a. Theory: The theory examination (both formative and summative) may be of descriptive answer of a question type, Multiple Choice Question (MCQ) type or mix of both types. Theory examination for summative examination shall be of four theory papers. The first and the fourth paper shall be on basic medical science and recent advances, respectively.

The theory examination shall be held well in advance before the clinical and practical examination.

b. Clinical/Practical and viva voce:

i. Clinical examination for the subjects in clinical sciences shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a consultant/specialist/teacher, for which candidates shall be examined for one long case and two short cases.

ii. Practical examination may consist of carrying out special investigative techniques for Diagnosis and Therapy. M.Ch. candidates shall also be examined in surgical procedures. Viva voce examination shall be comprehensive enough to test the candidate's overall knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the Speciality.

iii. Clinical/practical examination shall include Objective Structured Clinical Examination (OSCE).

C. Post-graduate Diploma: Diploma examination in any subject shall consist of theory and practical/clinical and viva voce.

a. Theory: There shall be three Theory papers. The first paper shall be on basic medical sciences. The theory examination will be held well in advance before the clinical examination.

b. Clinical/Practical and viva voce: Clinical examination for the subject in clinical Science shall be conducted to test/aimed at assessing the knowledge and competence of the candidate for undertaking

independent work as a specialist for which a candidate shall examine a minimum of one long case and two short cases.

The viva voce examination shall be thorough and shall aim at assessing the candidate's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the Speciality.

Clinical/practical examination shall include Objective Structured Clinical Examination (OSCE).

8.4 Valuation:

a. All the teachers of the other colleges of the concerned University or other Universities, who are eligible to be post-graduate examiners, can perform the valuation of the answerscripts.

b. All the answer scripts shall be subjected for two valuations by the concerned University. The average of the total marks awarded by the two valuators for the paper, which is rounded off to the nearest integer (whole number), shall be considered for computation of the results. All the answer scripts, where the difference between two valuations is 15% and more of the total marks prescribed for the paper, shall be subjected to third valuation. The average of the best two total marks, awarded by the three evaluators for the paper, rounded off to the nearest integer (whole number), shall be considered for final computation of the results.

c. After the computation and declaration of the results, under no circumstances, revaluation is permitted.

d. All the Health Universities/Institutions imparting post-graduate courses shall implement digital valuation.

CRITERIA FOR EVALUATION OF M.S./M.D./M.Ch./DM COURSES

S.No.	Description	M.S./M.D./M.Ch./DM Courses
1	**THEORY**	
	No. of Theory Papers	4
	Marks for each Theory Paper	100
	Total marks for Theory Paper	400
	Passing Minimum for Theory	200/400 (40% minimum in each paper)
2	**PRACTICAL/CLINICAL**	300
3	**VIVA VOCE**	100
	Passing minimum for Practical/Clinical including Viva voce	200/400
	The candidate shall secure not less than 50% marks in each head of passing which shall include (1) Theory – aggregate 50% (In addition, in each Theory paper a candidate has to secure minimum of 40%) (2) Practical/Clinical and Viva voce - aggregate 50% (3) If any candidate fails even under one head, he/she has to re-appear for both Theory and Practical/Clinical and Viva voce examination. (4) Five per cent of mark of total marks of Clinical/Practical and Viva Voce marks (20 marks) will be of dissertation/thesis and it will be part of clinical/practical examination marks. External examiner outside the state will evaluate dissertation/ thesis and take viva voce on it and marks will be given on quality of dissertation/thesis and performance on its viva voce. (5) No grace mark is permitted in post-graduate examination either for theory or for practical.	

CRITERIA FOR EVALUATION OF P.G. DIPLOMA COURSES

S. No.	Description	P.G. Diploma Courses
1	**THEORY**	
	No. of Theory Papers	3
	Marks for each Theory Paper	100
	Total marks for Theory Paper	300
	Passing Minimum for Theory	150/300 (40% minimum in each paper)
2	**PRACTICAL/CLINICAL**	200
3	**Viva voce**	100

	Passing minimum for Practical/Clinical including Viva voce	150/300
	The candidate shall secure not less than 50% marks in each head of passing which shall include (1) Theory – aggregate 50% (In addition, in each Theory paper a candidate has to secure minimum of 40%). (2) Practical/Clinical and Viva voce - aggregate 50%. (3) If any candidate fails even under one head, he/she has to re-appear for both Theory and Practical/Clinical and Viva voce examination. (4) No grace mark is permitted in post-graduate examination either for theory or for practical.	

CHAPTER IX

SANCTION AND PENALTY

9.1 Penalty for Violation of Regulations: For non-compliance or omission, the PGMEB will penalize the medical college/institution.

9.2 Without prejudice to anything stated at **Section 9.1** above, the imposition of the penalty which may include one/more/ all of the following –

a. Issuance of warning with direction to rectify/comply, as the case may be, by the medical institution.

b. Monetary penalty not exceeding INR one Crore per every violation/act of omission committed by the medical institution;.

c. Monetary penalty not exceeding Rupees five Lakhs for the faculty/ Head of the Department (HOD)/Dean/Director/Doctor submitting false declaration/ documents/ records (including patients' records). Further, they can also be charged or penalized for misconduct under the Professional Conduct Regulations in force.

d. Recommending to MARB for withholding processing of application(s) for any new course including increase of seats in the existing course for that academic year or for such number of years.

e. Reducing the number of students in the next or subsequent academic years to be admitted by the medical institution.

f. Stoppage of admission to one or more of the courses in the next or subsequent academic years.

g. Recommending to NMC for withdrawal of permission.

h. Any attempt to pressurize PGMEB or NMC through individuals or agency will lead to immediate halt of the processing the application/request by the medical institution.

Provided further that the medical institution, shall be granted a reasonable opportunity to rectify the deficiencies and any further action shall be taken if it fails to meet the requisite norms. Provided further that, the PGMEB or the NMC may also initiate criminal proceedings for furnishing false information, or fabrication of false documents as per the criminal law in force at that time.

CHAPTER X

MISCELLANEOUS

10.1 Faculty Development Programme: The Post-graduate Medical Education Board shall prescribe the Faculty Development Programme to enhance the skills of the faculty for post-graduate training, which will have to be mandatorily followed.

10.2 Animal Experimentation: Animal experimentation should continue to be included as an integral part of the competency-based curriculum of post-graduate courses in Physiology and Pharmacology in medical institutions.

However, the use of non-animal, human relevant methods may be encouraged for teaching and training of post-graduate students in these subjects, wherever possible. If animals are used as a part of research studies or thesis work, biomedical ethics and relevant rules and guidelines framed under the Prevention of Cruelty to Animals Act, 1960, must be strictly adhered to.

10.3 Collaborative Research: Impetus may be provided to Research in medical field to produce Physician Scientists of highest calibre by collaborative arrangement with other scientific organizations of excellence as well as Institutions of Eminence/ Excellence conferred by the Government of India. Inter-disciplinary research with AYUSH may be encouraged.

CHAPTER XI

AMENDMENTS, SAVING CLAUSE AND REPEAL

11.1 Provision to Amend the Post-Graduate Medical Education Regulations-2023: National Medical Commission is empowered to make any addition, deletion, substitution or any other amendment to Post-graduate Medical Education Regulations -2023, as and when required. The Post-graduate Medical Education Board is empowered to issue advisories and clarifications as and when required. The National Steering Committee constituted under **Section 5.2(xv)(XII)** to oversee the District Residency Programme (DRP) and will suggest practical ways in implementing District Residency Programme to achieve the objectives.

11.2 Saving Clause: Notwithstanding anything contained in these Regulations, any actions made under the *"Post-graduate Medical Education Regulations, 2000"* or the *"The Opening of a New or Higher Course of Study or Training (including Post-graduate Course of Study or Training) and Increase of Admission Capacity in any course of Study or Training (including a Post-Graduate course of Study or Training) Regulations, 2000"* or the recommendation of the Councils prior to that, shall be protected.

11.3 Repeal: The *"Post-graduate Medical Education Regulations, 2000"* and *"The Opening of a New or Higher Course of Study or Training (including Post-graduate Course of Study or Training) and Increase of Admission Capacity in any course of Study or Training (including a Post-Graduate course of Study or Training) Regulations, 2000"* are hereby repealed.

Dr. VIPUL AGGARWAL Secy.

[ADVT.-III/4/Exty./655/2023-24]

Note: These Regulations are being published in English and Hindi, the English version shall prevail in case of any doubt about the interpretation of these Regulations.

Annexure-1

[See Chapter II]

LIST OF RECOGNISED POST-GRADUATE BROAD SPECIALITY QUALIFICATIONS (M.D./M.S.)

A. M.D. (Doctor of Medicine)

1. M.D. (Aerospace Medicine)
2. M.D. (Anatomy)
3. M.D. (Anaesthesiology)
4. M.D. (Biochemistry)
5. M.D. (Biophysics)
6. M.D. (Community Medicine)
7. M.D. (Dermatology, Venereology and Leprosy)
8. M.D. (Emergency Medicine)
9. M.D. (Family Medicine)
10. M.D. (Forensic Medicine and Toxicology)
11. M.D. (General Medicine)
12. M.D. (Geriatrics)
13. M.D. (Health Administration)
14. M.D. (Hospital Administration)
15. M.D. (Immuno Haematology and Blood Transfusion)
16. M.D. (Laboratory Medicine)
17. M.D. (Marine Medicine)
18. M.D. [Master of Public Health (Epidemiology)]
19. M.D. (Microbiology)
20. M.D. (Nuclear Medicine)
21. M.D. (Paediatrics)
22. M.D. (Palliative Medicine)

23. M.D. (Pathology)
24. M.D. (Pharmacology)
25. M.D. (Physical Medicine Rehabilitation)
26. M.D. (Physiology)
27. M.D. (Psychiatry)
28. M.D. (Radiation Oncology)
29. M.D. (Radio-diagnosis)
30. M.D. (Respiratory Medicine)
31. M.D. (Sports Medicine)
32. M.D. (Tropical Medicine)

B. M.S. (Master of Surgery)

1. M.S. (General Surgery)
2. M.S. (Obstetrics and Gynaecology)
3. M.S. (Ophthalmology)
4. M.S. (Orthopaedics)
5. M.S. (Otorhinolaryngology)
6. M.S. (Traumatology and Surgery)

Annexure-2

[See Chapter II]

LIST OF RECOGNISED POST-GRADUATE SUPER SPECIALITY QUALIFICATIONS (D.M./M.Ch.)

A. Doctorate of Medicine

1. D.M. (Cardiac Anaesthesia)
2. D.M. (Cardiology)
3. D.M. (Child and Adolescent Psychiatry)
4. D.M. (Clinical Haematology)
5. D.M. (Clinical Immunology and Rheumatology)
6. D.M. (Clinical Pharmacology)
7. D.M. (Critical Care Medicine)
8. D.M. (Endocrinology)
9. D.M. (Geriatric Mental Health)
10. D.M. (Hepatology)
11. D.M. (Infectious Disease)
12. D.M. (Interventional Radiology)
13. D.M. (Medical Gastroenterology)
14. D.M. (Medical Genetics)
15. D.M. (Medical Oncology)
16. D.M. (Neonatology)

17. D.M. (Nephrology)

18. D.M. (Neuro-Anaesthesia)

19. D.M. (Neurology)

20. D.M. (Neuro-radiology)

21. D.M. (Onco-Pathology)

22. D.M. (Organ Transplant Anaesthesia and Critical Care)

23. D.M. (Paediatric and Neonatal Anaesthesia)

24. D.M. (Paediatric Cardiology)

25. D.M. (Paediatric Critical Care)

26. D.M. (Paediatric Gastroenterology)

27. D.M. (Paediatric Hepatology)

28. D.M. (Paediatric Nephrology)

29. D.M. (Paediatric Neurology)

30. D.M. (Paediatric Oncology)

31. D.M. (Pulmonary Medicine)

32. D.M. (Virology)

B. M.Ch. (Master of Chirurgie)

1. M.Ch. (Endocrine Surgery)

2. M.Ch. (Gynaecological Oncology)

3. M.Ch. (Hand Surgery)

4. M.Ch. (Head and Neck Surgery)

5. M.Ch. (Hepato-Pancreatto-Biliary-Surgery)

6. M.Ch. (Neurosurgery)

7. M.Ch. (Paediatric Cardio Thoracic Vascular Surgery)

8. M.Ch. (Paediatric Orthopaedics)

9. M.Ch. (Paediatric Surgery)

10. M.Ch. (Plastic and Reconstructive Surgery)

11. M.Ch. (Reproductive Medicine and Surgery)

12. M.Ch. (Surgical Gastroenterology)

13. M.Ch. (Surgical Oncology)

14. M.Ch. (Urology)

15. M.Ch. (Vascular Surgery)

16. M.Ch. (Cardio Vascular and Thoracic Surgery)

Annexure-3

[See Chapter II]

LIST OF RECOGNISED POST-GRADUATE DIPLOMA QUALIFICATIONS

1. Allergy and Clinical Immunology
2. Anaesthesiology (D.A.)
3. Clinical Pathology (D.C.P.)
4. Community Medicine (D.C.M.)/ Public Health (D.P.H.)
5. Dermatology, Venereology and Leprosy (D.D.V.L.)
6. Forensic Medicine (D.F.M.)
7. Health Education (D.H.E.)
8. Health Administration (D.H.A.)
9. Immuno-Haematology and Blood Transfusion (D.I.H.B.T.)
10. Marine Medicine (Dip. M.M.)
11. Microbiology (D.Micro)
12. Nutrition (D.N.)
13. Obstetrics and Gynaecology (D.G.O.)
14. Occupational Health (D.O.H.)
15. Ophthalmology (D.O.)
16. Orthopaedics (D.Ortho.)
17. Otorhinolaryngology (D.L.O.)
18. Paediatrics (D.C.H.)
19. Physical Medicine and Rehabilitation (D.Phy. Med. and R.)
20. Psychiatry (D.P.M.)
21. Radiation Medicine (D.R.M.)
22. Radiodiagnosis (D.M.R.D.)
23. Radio-therapy (D.M.R.T.)
24. Radiological Physics (D.R.P.)
25. Sport Medicine (D.S.M.)
26. Tropical Medicine and Health (D.T.M. and H.)
27. Tuberculosis and Chest Diseases (D.T.C.D.)
28. Virology (D. Vir.)

Annexure-4

[See Chapter II]

LIST OF RECOGNISED POST-DOCTORAL CERTIFICATE COURSES (PDCC) QUALIFICATION

1. PDCC in Organ Transplant Anaesthesia
2. PDCC in Paediatric Endocrinology
3. PDCC in Laboratory Immunology
4. PDCC in Nuclear Nephrology

5. PDCC in Renal Pathology
6. PDCC in Gastro-Radiology
7. PDCC in Aphaeresis Technology and Blood Component Therapy
8. PDCC in Pain Management
9. PDCC in Haemato-Oncology
10. PDCC in Paediatric Endocrinology
11. PDCC in Paediatric ENT
12. PDCC in Spine Surgery

Annexure-5

[See Chapter II]

LIST OF RECOGNISED POST-DOCTORAL FELLOWSHIP (PDF) QUALIFICATION

Annexure-6

[See Chapter II]

LIST OF D.M./ M.CH. COURSES OF SIX YEARS DURATION

1. D.M. (Neurology)
2. M.Ch.(Neurosurgery)

Annexure-7

[See Section 4.1]

FEEDER BROAD SPECIALITY QUALIFICATIONS FOR SUPER SPECIALITY COURSES

A. D.M. (Doctorate of Medicine)

S.No.	Area of Specialization	Feeder Broad Speciality Qualification(s)
1.	D.M. (Cardiac Anaesthesia)	M.D./DNB (Anaesthesia)
2.	D.M. (Cardiology)	M.D./DNB (General Medicine) M.D./DNB (Paediatrics) M.D./DNB (Respiratory Medicine)
3.	D.M. (Child and Adolescent Psychiatry)	M.D./DNB (Psychiatry)
4.	D.M. (Clinical Haematology)	M.D./DNB (Biochemistry) M.D./DNB (General Medicine) M.D./DNB (Paediatrics) M.D./DNB (Pathology)
5.	D.M. (Clinical Immunology and Rheumatology)	M.D./DNB (General Medicine) M.D./DNB (Paediatrics)
6.	D.M. (Clinical Pharmacology)	M.D./DNB (Pharmacology)
7.	D.M. (Critical Care Medicine)	M.D./DNB (Anaesthesia) M.D./DNB (General Medicine) M.D./DNB (Paediatrics) M.D./DNB (Respiratory Medicine) M.D./DNB (Emergency Medicine)

S.No.	Area of Specialization	Feeder Broad Speciality Qualification(s)
8.	D.M. (Endocrinology)	M.D./DNB (General Medicine) M.D./DNB (Paediatrics)
9.	D.M. (Geriatric Mental Health)	M.D./DNB (Psychiatry)
10.	D.M. (Hepatology)	M.D./DNB (General Medicine) M.D./DNB (Paediatrics)
11.	D.M. (Infectious Disease)	M.D./DNB (General Medicine) M.D./DNB (Paediatrics) M.D./DNB (Microbiology) M.D./DNB (Respiratory Medicine) M.D./DNB (Tropical Medicine)
12.	D.M. (Interventional Radiology)	M.D./DNB (Radio-diagnosis)
13.	D.M. (Medical Gastroenterology)	M.D./DNB (General Medicine)
14.	D.M. (Medical Genetics)	M.D./M.S./DNB in any subject
15.	D.M. (Medical Oncology)	M.D./DNB (General Medicine) M.D./DNB (Paediatrics) M.D./DNB (Radiation Oncology)
16.	D.M. (Neonatology)	M.D./DNB (Paediatrics)
17.	D.M. (Nephrology)	M.D./DNB (General Medicine) M.D./DNB (Paediatrics)
18.	D.M. (Neuro- Anaesthesia)	M.D./DNB (Anaesthesia)
19.	D.M. (Neurology)	M.D./DNB (General Medicine) M.D./DNB (Paediatrics)
20.	D.M. (Neuro-radiology)	M.D./DNB (Radio-diagnosis)
21.	D.M. (Onco-Pathology)	M.D./DNB (Pathology)
22.	D.M. (Organ Transplant Anaesthesia and Critical Care)	M.D./DNB (Anaesthesia)
23.	D.M. (Paediatric and Neonatal Anaesthesia)	M.D./DNB (Anaesthesia)
24.	D.M. (Paediatric Cardiology)	M.D./DNB (Paediatrics)
25.	D.M. (Paediatric Critical Care)	M.D./DNB (Paediatrics)
26.	D.M. (Paediatric Gastroenterology)	M.D./DNB (Paediatrics)
27.	D.M. (Paediatric Hepatology)	M.D./DNB (Paediatrics)
28.	D.M. (Paediatric Nephrology)	M.D./DNB (Paediatrics)
29.	D.M. (Paediatric Neurology)	M.D./DNB (Paediatrics)

S.No.	Area of Specialization	Feeder Broad Speciality Qualification(s)
30.	D.M. (Paediatric Oncology)	M.D./DNB (Paediatrics)
31.	D.M. (Pulmonary Medicine)	M.D./DNB (General Medicine) M.D./DNB (Respiratory Medicine) M.D./DNB (Paediatrics)
32.	D.M. (Virology)	M.D./DNB (Microbiology)

B. M.Ch. (Master of Chirurgie)

Sl. No.	Area of Specialization	Feeder Broad Speciality Qualification(s)
1.	M.Ch. (Endocrine Surgery)	M.S./DNB (General Surgery)
2.	M.Ch. (Gynaecological Oncology)	M.D./M.S./DNB (Obstetrics and Gynaecology)
3.	M.Ch. (Hand Surgery)	M.S./DNB (Orthopaedics)
4.	M.Ch. (Head and Neck Surgery)	M.S./DNB (Otorhinolaryngology) M.S./DNB (General Surgery)
5.	M.Ch. (Hepato-Pancreatto-Billiary-Surgery)	M.S./DNB (General Surgery)
6.	M.Ch. (Neurosurgery)	M.S./DNB (General Surgery) M.S./DNB (Otorhinolaryngology)
7.	M.Ch. (Paediatric Cardio Thoracic Vascular Surgery)	M.S./DNB (General Surgery)
8.	M.Ch. (Paediatric Orthopaedics)	M.S./DNB (Orthopaedics)
9.	M.Ch. (Paediatric Surgery)	M.S./DNB (General Surgery)
10.	M.Ch. (Plastic and Reconstructive Surgery)	M.S./DNB (General Surgery) M.S./DNB (Otorhinolaryngology)
11.	M.Ch. (Reproductive Medicine and Surgery)	M.D./M.S./DNB (Obstetrics and Gynaecology)
12.	M.Ch. (Surgical Gastroenterology)	M.S./DNB (General Surgery)
13.	M.Ch. (Surgical Oncology)	M.S./DNB (General Surgery) M.S./DNB (Otorhinolaryngology) M.S./DNB (Orthopaedics)
14.	M.Ch. (Urology)	M.S./DNB (General Surgery)
15.	M.Ch. (Vascular Surgery)	M.S./DNB (General Surgery)
16.	M.Ch. (Cardio Vascular and Thoracic Surgery)	M.S./DNB (General Surgery)

Annexure-8

[See Section 4.8]

Schedule to the Rights of Persons with Disabilities (RPWD) Act, 2016

"SPECIFIED DISABILITY"

1. Physical disability

A. Locomotor disability (a person's inability to execute distinctive activities associated with movement of self and objects resulting from affliction of musculoskeletal or nervous system or both), including –

(a) "leprosy cured person" means a person who has been cured of leprosy but is suffering from –

(i) Loss of sensation in hands or feet as well as loss of sensation and paresis in the eye and eye-lid but with no manifest deformity;

(ii) Manifest deformity and paresis but having sufficient mobility in their hands and feet to enable them to engage in normal economic activity;

(iii) extreme physical deformity as well as advanced age which prevents him/her from undertaking any gainful occupation, and the expression "leprosy cured" shall be construed accordingly;

(b) "cerebral palsy" means a group of non-progressive neurological condition affecting body movements and muscle coordination, caused by damage to one or more specific areas of the brain, usually occurring before, during or shortly after birth;

(c) "Dwarfism" means a medical or genetic condition resulting in an adult height of 4 feet 10 inches (147 centimetres) or less;

(d) "Muscular dystrophy" means a group of hereditary genetic muscle disease that weakens the muscles that move the human body and persons with multiple dystrophy have incorrect and missing information in their genes, which prevents them from making the proteins they need for healthy muscles. It is characterised by progressive skeletal muscle weakness, defects in muscle proteins, and the death of muscle cells and tissue;

(e) "acid attack victims" means a person disfigured due to violent assaults by throwing of acid or similar corrosive substance.

B. Visual impairment—

(a) "blindness" means a condition where a person has any of the following conditions, after best correction—

(i) total absence of sight; or

(ii) visual acuity less than 3/60 or less than 10/200 (Snellen) in the better eye with best possible correction; or

(iii) limitation of the field of vision subtending an angle of less than 10 degree.

(b) "low-vision" means a condition where a person has any of the following conditions, namely: —

(i) visual acuity not exceeding 6/18 or less than 20/60 up to 3/60 or up to 10/200 (Snellen) in the better eye with best possible corrections; or

(ii) limitation of the field of vision subtending an angle of less than 40 degree up to 10 degree.

C. Hearing impairment—

(a) "deaf" means persons having 70 DB hearing loss in speech frequencies in both ears;

(b) "hard of hearing" means person having 60 DB to 70 DB hearing loss in speech frequencies in both ears;

D. "speech and language disability" mean a permanent disability arising out of conditions such as laryngectomy or aphasia affecting one or more components of speech and language due to organic or neurological causes.

2. **Intellectual disability,** a condition characterised by significant limitation both in intellectual functioning (reasoning, learning, problem solving) and in adaptive behaviour which covers a range of every day, social and practical skills, including -

(a) "specific learning disabilities" means a heterogeneous group of conditions wherein there is a deficit in processing language, spoken or written, that may manifest itself as a difficulty to comprehend, speak, read, write, spell, or to do mathematical calculations and includes such conditions as perceptual disabilities, dyslexia, dysgraphia, dyscalculia, dyspraxia and developmental aphasia;

(b) "autism spectrum disorder" means a neuro-developmental condition typically appearing in the first three years of life that significantly affects a person's ability to communicate, understand relationships and relate to others, and is frequently associated with unusual or stereotypical rituals or behaviours.

3. **Mental behaviour —** "mental illness" means a substantial disorder of thinking, mood, perception, orientation or memory that grossly impairs judgment, behaviour, capacity to recognise reality or ability to meet the ordinary demands of life, but does not include retardation which is a condition of arrested or incomplete development of mind of a person, specially characterised by sub normality of intelligence.

4. **Disability** caused due to—

(a) chronic neurological conditions, such as—

(i) "Multiple sclerosis" means an inflammatory, nervous system disease in which the myelin sheaths around the axons of nerve cells of the brain and spinal cord are damaged, leading to demyelination and affecting the ability of nerve cells in the brain and spinal cord to communicate with each other;

(ii) "Parkinson's disease" means a progressive disease of the nervous system marked by tremor, muscular rigidity, and slow, imprecise movement, chiefly affecting middle-aged and elderly people associated with degeneration of the basal ganglia of the brain and a deficiency of the neurotransmitter dopamine.

(b) Blood disorder—

(i) "Haemophilia" means an inheritable disease, usually affecting only male but transmitted by women to their male children, characterised by loss or impairment of the normal clotting ability of blood so that a minor wound may result in fatal bleeding;

(ii) "Thalassemia" means a group of inherited disorders characterised by reduced or absent amounts of haemoglobin.

(iii) "Sickle cell disease" means a haemolytic disorder characterised by chronic anaemia, painful events, and various complications due to associated tissue and organ damage; "haemolytic" refers to the destruction of the cell membrane of red blood cells resulting in the release of haemoglobin.

5. **Multiple Disabilities** (more than one of the above specified disabilities) including deaf blindness which means a condition in which a person may have combination of hearing and visual impairments causing severe communication, developmental, and educational problems.

6. Any other category as may be notified by the Central Government.

Note: Any amendment to the Schedule to the RPWD Act, 2016, shall consequently stand amended in the above Annexure.

Annexure-9

[See Section 4.8]

Guidelines regarding admission of students with "Specified Disabilities" under the Rights of Persons with Disabilities Act, 2016 with respect to admission in Post-graduate Courses in Modern Medicine

Note:

1. The "Certificate of Disability" shall be issued in accordance with the Rights of Persons with Disabilities Rules, 2017 notified in the Gazette of India by the Ministry of Social Justice and Empowerment [Department of Empowerment of Persons with Disabilities (*Divyangjan*)] on 15th June 2017.

2. The extent of "specified disability" in a person shall be assessed in accordance with the "Guidelines for the purpose of assessing the extent of specified disability in a person included under the Rights of Persons with Disabilities Act, 2016 (49 of 2016)" notified in the Gazette of India by the Ministry of Social Justice and Empowerment [Department ofEmpowerment of Persons with Disabilities (*Divyangjan*)] on 4th January 2018.

3. The minimum degree of disability should be 40% (Benchmark Disability) in order to be eligible for availing reservation for persons with specified disability.

4. The term 'Persons with Disabilities' (PwD) is to be used instead of the term 'Physically Handicapped' (PH).

S. No.	Disability Type	Type of Disabilities	Specified Disability	Disability Range		
				Eligible for Medical Course, Not Eligible for PwD Quota	**Eligible for Medical Course, Eligible for PwD Quota**	**Not Eligible for Medical Course**
1.	**Physical Disability**	**A. Locomotor Disability, including Specified Disabilities (a to f).**	a. Leprosy cured person*	Less than 40% disability	40-80% disability. Persons with more than 80% disability may also be allowed on case to case basis and their functional competency will be determined with the aid of assistive devices, if it is being used, to see if it is	More than80%
			b. Cerebral Palsy**			
			c. Dwarfism			
			d. Muscular Dystrophy			
			e. Acid attack victims			

			f. Others*** such as Amputation, Poliomyelitis, etc.		brought below 80% and whether they possess sufficient motor ability as required to pursue and complete the course satisfactorily.	
			* Attention should be paid to loss of sensations in fingers and hands, amputation, as well as involvement of eyes and corresponding recommendations be looked at. ** Attention should be paid to impairment of vision, hearing, cognitive function, etc. andcorresponding recommendations be looked at. *** Both hands intact, with intact sensations, sufficient strength and range of motion are essential to be considered eligible for medical course.			
		B. Visual Impairment (*)	a. Blindness b. Low vision	Less than 40% disability	----	Equal to or more than 40% Disability
		C. Hearing Impairment @	a. Deaf b. Hard of hearing	Less than 40% Disability	----	Equal to or more than 40% Disability
			(*) Persons with Visual impairment / visual disability of more than 40% may be made eligible to pursue Post-graduate Medical Education and may be given reservation,subject to the condition that the visual disability is brought to a level of less than the benchmark of 40% with advanced low vision aids such as telescopes / magnifier etc. @ Persons with hearing disability of more than 40% may be made eligible to pursue Post-graduate Medical Education and may be given reservation, subject to the condition that the hearing disability is brought to a level of less than the benchmark of 40% with the aid of assistive devices. In addition to this, the individual should have a speech discrimination score of more than 60 %.			
		D. Speech andlanguage disability$	Organic/ neurological causes	Less than 40% Disability	-	Equal to or more than 40% Disability
		$ Persons with Speech Intelligibility Affected (SIA) shall be eligible to pursue post-graduate courses, provided Speech Intelligibility Affected (SIA) score shall not exceed 3(three), which is 40% or below. Persons with Aphasia shall be eligible to pursue post-graduate courses, provided Aphasia Quotient (AQ) is 40% or below.				

Sl. No.	**Disability Type**	**Type of Disabilities**	**SpecifiedDisability**	**Disability Range**		
				Eligible for Medical Course, Not Eligible for PwD Quota	**Eligible for Medical Course, Eligible for PwD Quota**	**Not Eligible for Medical Course**
2.	**Intellectual Disability**		a. Specific learning disabilities (Perceptual disabilities, Dyslexia, Dyscalculia, Dyspraxia and Developmental aphasia) #	# Currently there is no Quantification scale available to assess the severity ofSpLD, therefore the cut-off of 40% is arbitrary and more evidence is needed.		
				Less than 40% Disability	Equal to or more than 40% disability and equal to or lessthan 80%. But selection will be based on the learning competency evaluated with the help of the remediation/assisted technology/aids/infrastru	More than 80% or severe nature or significant cognitive/intellectual disability

					ctural changes by the Expert Panel	
			b. Autism spectrum disorders	Absence or Mild Disability, Aspergersyndrome (disability of up to 60% as per ISAA) where the individual is fit for post-graduate course by an expert panel	Currently not recommended due to lack of objective method to establish presence and extent of mental illness. However, the benefit of reservation/quota may be considered in future after developing better methods of disability assessment.	More than 60% disability or presence of cognitive/intellectu al disability and/or if the person is unfit for pursuing post-graduate course by an expert panel
3.	**Mental behaviour**		Mental illness	Absence or mild Disability: less than 40% (under IDEAS)	Currently not recommended due to lack of objective method to establish presence and extent of mental illness. However, the benefit of reservation/quota may be considered in future after developing better methods of disability assessment.	No mental disorder is barred from pursuing PG Medical education subject to being eligible in NExT/NEET-PG
4.	**Disability caused due to**	**a. Chronic Neurological Conditions**	i. Multiple Sclerosis ii. Parkinsonism	Less than 40% Disability	40-80% disability	More than 80%
		b. Blood Disorders	i. Haemophilia ii. Thalassemia iii. Sickle cell disease	Less than 40% Disability	40-80% disability	More than 80%
5.	**Multiple disabilities including deaf blindness**		More than one of the above specified disabilities	Must consider all above while deciding in individual cases recommendations with respect to presence any of the above, namely, Visual, Hearing, Speech and Language disability, Intellectual Disability, and Mental Illness as a component of Multiple Disability. Combining Formula as notified by the related Gazette Notification issued by the Govt. of India $a + \left[\frac{b\,(90-a)}{90}\right]$ (where a= higher value of disability % and b=lower value of disability % as calculated for different disabilities) is recommended for computing the disability arising when more than one disabling condition is present in a given individual. This formula may be used in cases with multiple disabilities, and recommendations regarding admission and/or reservation made as per the specific disabilities present in a given individual.		

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Foreword

Pandemic Management

The Medical Council of India has prepared revised Regulations on Graduate Medical Education and competency based Undergraduate curricula, accompanied by detailed guidance for its implementation. One of the desirable outcomes of the Competency derived education program is to enable the Indian Medical Graduate to be prepared for the unknown - to be able to understand, investigate, treat and prevent new and emerging diseases as a clinician, community leader and scholar. The emergence of COVID19 and its rapid spread across the globe has further underlined the need to develop these skills in our graduates.

This Pandemic Management module is designed to ensure that the MBBS student acquires competencies in handling not only the illness, but also the social, legal and other issues arising from such disease outbreaks. A pandemic or disease outbreak calls in to play all the five roles envisaged for the Indian Medical Graduate viz. clinician, communicator, leader and member of health care team, professional, life-long learner and committed to excellence, is ethical, responsive and accountable to patients. It is expected that this longitudinal module extending from Foundation Course to the final year undergraduate program will help in ensuring the creation of an IMG who will serve humanity as a doctor, leader and healer in bleak times such as the occurrence of a pandemic.

We are grateful to the members of the Expert Group and the Academic Cell for painstakingly putting this booklet together. We hope that teachers and institutions will benefit in creating a generation of Indian Medical Graduates who will be able to provide promotive, preventive and curative aspects of health care to the nation in times of extreme need like the outbreak of a pandemic.

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MEDICAL COUNCIL OF INDIA

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IN SUPERSESSION OF MEDICAL COUNCIL OF INDIA

Foreword

Pandemic Management

The world community including India is facing an unprecedented crisis due to the rapidly spreading Covid-19 infection, across countries and continents. Recent reports indicate Covid-19 cases have crossed the 18 million mark globally. The impact of Covid-19 infection is being felt severely on the health sector. An acute necessity is being felt to maximise the health care facilities available in the country particularly the availability of trained health care workers to meet this unexpected health crisis.

The Competency based undergraduate curriculum was designed to enable the Indian Medical Graduate to be prepared to meet new challenges - to be able to recognise, diagnose, investigate, and treat newly emerging diseases as a clinician and community health leader; the Covid-19 pandemic outbreak has provided this opportunity. The longitudinal module on Pandemic Management extending from Foundation Course to the final year undergraduate program prepared by the Academic Cell and Expert Group is designed to provide year-wise detailed protocols in training the students to fulfil their role as a doctor, leader and healer during this difficult period of a rampaging pandemic. The Medical Council of India is appreciative of the efforts of the members of the Expert Group and the Academic Cell in preparing this module in a very short time.

Vats 19/8/20

(Dr. R.K. Vats)
Secretary General

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How to use this document

This document has been prepared, considering the metamorphosis of a first year MBBS student to the Indian Medical Graduate (IMG) and the knowledge and competence that is expected from him/her in adapting to and managing a clinical condition that is predicted to happen, too often in the form of outbreaks, epidemics and pandemics, during his/her career.

The module is arranged in a Phase-based manner. It is expected that components of Self Directed Learning, Early Clinical Exposure, Integration and alignment as envisaged in the Competency documents (2018) would be incorporated in the execution of these modules in various phases, as applicable. It is also expected that the modules would be covered by an interdisciplinary team under supervision by the college level Curriculum Committee. The major coordinating departments involved in the execution of this document are identified in the table below.

Longitudinal Module on Management of Pandemics for MBBS course

Period	Module	Broad areas	No. of hours	Major department(s) to coordinate
Foundation Course	F.1	History of Outbreaks, Epidemics & Pandemics	2	Pre-Clinical
Phase I	1.1	Infection Control: Part - I Infection Control Practices – Hand washing, Decontamination Use of PPEs	4	Microbiology
Phase II	2.1	Infection Control: Part II Air borne precautions Contact Precautions Infection Control Committee	4	Microbiology
	2.2	Emerging and Re-emerging infections, early identification and control of new infections	6	Community Medicine
	2.3	Sample Collection, Microbial diagnosis, Serologic tests and their performance parameters	6	Microbiology
	2.4	Vaccination strategies including vaccine development & Implementation	6	Community Medicine, Biochemistry
	2.5	Therapeutic strategies including new drug development	6	Pharmacology, General Medicine
Phase III Part 1	3.1	Outbreak Management including Quarantine, Isolation, Contact Tracing	5	Community Medicine
	3.2	Interdisciplinary Collaboration, Principles of Public Health Administration, Health Economics, International Health	5	
	3.3	Operational Research, Field work, Surveillance	8	
Electives		Epidemiology and research Components		Community Medicine
Phase III Part 2	4.1	Care of patients during Pandemics	6	Clinical departments (General Medicine, Pulmonary Medicine, Anaesthesiology as Integrated sessions)
	4.2	Emergency Procedures	8	
	4.3	Death related management	2	
	4.4	Communications and media management	4	
	4.5	Intensive Care Management during Pandemics	4	
	4.6	Palliative Care during Pandemics	4	
		Total	80 hours	

Skills suggested

1. **Infection Control related**
    a. Hand washing
    b. PPE Donning & Doffing
    c. Disinfection

2. **Diagnostic**
    a. Sample collection
    b. Sample transportation & storage
    c. Choose the appropriate test based on performance parameters

3. **Disease Management**
    a. Pharmaco-vigilance measures
    b. Protocol based Management
    c. Therapeutic decision making
    d. Terminal care including CPR, ALS, PALS

4. **Epidemic Management**
    a. Outbreak investigation
    b. Contact tracing, Quarantine and Isolation
    c. Surveillance
    d. Documentation

5. **Research**
    a. Operational research
    b. Clinical trial protocol preparation including Vaccine trials
    c. Ethical considerations

6. **Communication**
    a. To the media
    b. Use of Telemedicine
    c. Patient & stakeholder communication

7. **Intensive Care**

8. **Palliative care during pandemics**

Foundation Course

Module F

Module F.1
History of Outbreaks, Epidemics & Pandemics

Background:

The occurrence of disease is a common phenomenon in communities. The frequency with which disease occurs in a population depends upon a number of epidemiological factors specific to the host, agent and environment including geographical location. Most of the diseases occur with a predictable frequency which is considered as normal for the population in that area. If there is increase in the frequency (more than expected), change in type of host population, clinical manifestations or involvement of newer geographical locations, then depending upon the extent of involvement, an outbreak, epidemic or pandemic has occurred.

A medical student must be aware of such events that have occurred in the past. This can help them learn from historical events, particularly causative or precipitating factors that might have resulted in such events, the most successful strategy that lead to its control and ways that can help in predicting and controlling future events of similar nature and / or magnitude.

Competencies addressed:

The student should demonstrate the ability to:	**Level**
Define pandemic and differentiate it from outbreak/epidemic.	K
Identify the reasons and /or events that lead to pandemics in the past.	KH
Describe key strategies (by the State/Central Government, Non-Government Organization and society at large) that were adopted in prevention and control of these pandemics.	KH
Discuss the role which will be played by National and International bodies like WHO and ICMR, if these events take place	KH

Learning Experience

Year of study: Foundation course Professional year 1

Hours: two (02)

i. Reading history of pandemics in small groups- 0.5 hours

ii. Identifying reasons/events that lead to these pandemics - 0.5 hours

iii. Sharing with large group & summarizing learning points - 1 hour

Students can also be given assignments where they can come prepared with the history of pandemics in the past through online/offline resources or hand outs can be made for them to discuss in class.

Some of the points for discussion in small group can be-

- Type of microbe involved in the pandemic and its properties that helped it spread e.g. route of entry and exit from host, mechanism of transmission involved, ability to survive on various external surfaces etc.
- How did the microbe evolve? Is this emerging or re-emerging in nature?
- Identify common factors in the community that helped the microbe to re/emerge and spread e.g. deforestation, change in trade practices, Host characteristics that supported the spread etc.
- Impact on health, economics and society,
- Steps taken to control the pandemic,
- Time taken to control,
- Current state of infection by that organism.

Assessment

1**. Formative**: Not required

2. **Summative:** Not required

Introductory write-up:

A **pandemic** is derived from a Greek word (*pan*, ="all" and *demos*, ="people"). This is an epidemic that affects a significant number of people across a large geographic location, multiple continents or worldwide. Pandemics usually are caused by new microbes, particularly viruses. A large number of previously unexposed population is highly susceptible to these new microbes and if the disease is capable of human to human transmission, then the spread of these organisms is quite rapid leading to pandemics with major impact on society.

Thus, depending upon the pathogenic/ virulence properties of the new microbe, host susceptibilities and risk factors, pandemics can result in significant increase in morbidity and mortality in affected population in large geographic areas with huge impact on the economic growth, social life, and political parties.

Though most of the times it is difficult to pinpoint the factors that result in emergence or re-emergence of microbes capable of causing pandemics, some of the factors that are contributing significantly are global travel, industrial development, urbanization, global food production, wildlife trade, deforestation and overall misuse of nature. Socio-economic and anthropogenic environmental changes have resulted in emerging zoonosis, which can spread and cause pandemics as had happened in the spread of Black Death in the 14th century due to expansion of trade routes.

Further, the way the world is connected today, human beings have become extremely vulnerable to the rapid spread of new infections including zoonosis. A primarily animal pathogen can evolve into a human pathogen, and then with time, need for the original animal host is lost as microbes establish human-to-human transmission. Though this is a gradual process, but it has resulted in evolution of many predominantly human viral pathogens like smallpox, Human Immunodeficiency Virus(HIV), Nipah virus, Rabies, West Nile viruses, Ebola, Marburg, human monkey pox viruses, influenza A, dengue, SARS, Corona virus etc. resulting in widespread outbreaks, epidemics as well as pandemics.

As declared by the World Health Organization, the latest pandemic that we are facing globally is Covid-19 pandemic, a respiratory illness caused by the newly identified Coronavirus, which has originated in the live market of Wuhan in China. But this is not new as a large number of pandemics have happened in the past and few examples of devastating pandemics are given below:

1) Antonine Plague (165 AD)

Death Toll: 5 million
Cause: Unknown
Antonine Plague was an ancient pandemic that affected Asia Minor, Egypt, Greece and Italy and is thought to have been either Smallpox or Measles, though the true cause is still unknown.

2) Plague of Justinian (541-542 AD)

Death Toll: 25 million
Cause: Bubonic Plague
Generally regarded as the first recorded incident of the Bubonic Plague, killed up to a quarter of the population of the Eastern Mediterranean and devastated the city of Constantinople by killing an estimated 5,000 people per day and eventually resulting in the deaths of 40% of the city's population.

3) The Black Death (1346-1353 AD)

Death Toll: 75 – 200 million
Cause: Bubonic Plague
Bubonic Plague is thought to have originated in Asia. It spread most likely via the fleas living on the rats that commonly lived on merchant ships. Ports being major urban centres at the time, gave the perfect breeding ground for rats and fleas, and thus the insidious bacterium flourished, devastating three continents.

4) Third Cholera Pandemic (1852–1860 AD)

Death Toll: 1 million

Cause: Cholera

Third Cholera Pandemic was the deadliest of the seven cholera pandemics. This originated in India, spreading from the Ganges River Delta before spreading through Asia, Europe, North America and Africa. British physician John Snow succeeded in identifying contaminated water as the means of transmission for the disease.

5) Flu Pandemic (1889-1890 AD)

Death Toll: 1 million

Cause: Influenza virus

It was also known as “Asiatic Flu” or “Russian Flu”. This was thought to be an outbreak due to the Influenza A virus. Rapid population growth of the 19th century, particularly in urban areas, helped in the spread of the flu, and the outbreak spread rapidly across the globe.

6) **Sixth Cholera Pandemi**c (**1899-1923)**

Death Toll: 800,000+

Cause: Cholera

Originated in India then spread to the Middle East, North Africa, Eastern Europe and Russia.

7) Flu Pandemic (1918)

Death Toll: 20 -50 million

Cause: Influenza virus

1918 flu pandemic was different from other influenza outbreaks. The host properties of Influenza virus were affecting the juveniles previously and the elderly or already immunologically weak individuals but, the new strain had infected and killed completely

healthy young adults, leaving children and those with weaker immune systems still alive.

8) Asian Flu (1956-1958)

Death Toll: 2 million

Cause: Influenza virus

Asian Flu was a pandemic outbreak of Influenza A of the H2N2 subtype, that originated in China in 1956 and lasted until 1958.

9) Flu Pandemic (1968)

Death Toll: 1 million

Cause: Influenza virus

“The Hong Kong Flu” was caused by the H3N2 strain of the Influenza A virus. Outbreak appeared in July 1968 in Hong Kong and by September 1968 virus had spread to Philippines, India, Australia, Europe, and the United States.

10) HIV/AIDS Pandemic (at its peak, 2005-2012)

Death Toll: 36 million

Cause: HIV/AIDS

It was first identified in the Democratic Republic of the Congo in 1976.Currently, there are nearly 35 million people living with HIV. As awareness has grown, new treatments have been developed that make HIV far more manageable, and many of those infected go on to lead productive lives.

11) Covid-19, the novel Coronavirus:

In December 2019, in the region of Wuhan, China, a new (“novel”) Coronavirus began appearing in human beings. This new virus named as Covid-19, spreads incredibly quickly among people, due to its newness – no one had immunity to Covid-19, because no one had Covid-19 until 2019. Countries across the world declared mandatory stay-at-home measures, closing schools, businesses, and public places to curtail the spread of disease.

The outcome of the Covid-19 pandemic is difficult to predict, at least presently. But we can learn from the history of pandemics to determine our best course of action.

Dealing with pandemics

Looking back in history, we can see respiratory viruses, particularly influenza viruses have been a major cause of repeated pandemics. This has justified the need for global influenza surveillance and monitoring systems, so as to keep an active surveillance of the strains of virus, their pathogenic potentials and host preferences. WHO has developed pandemic phases in 1999 with latest revisions in 2009 as planning tools that can loosely correspond to pandemic risk, identify sustained human to human transmission and give time for preparedness and response. These tools are not designed to predict. The six phases as given by WHO can be studied in three stages-

1. Inter-pandemic phase
2. Pandemic alert period
3. Pandemic phase

Thus, a basic understanding of these phases provides a framework to help countries to tackle the pandemic and prepare response planning.

Preparedness for impending pandemics is a necessary step to successful handling with minimal loss of life, economic and social disruptions. This requires involvement of government leadership, health sector, on-health sectors, individuals, families, and communities whole-heartedly. Activities that lead to capacity development, planning, coordination, and communication at various levels are critical for successful management.

The **WHO** plays an important role in rapid detection and verification of health emergencies like pandemics, as this is essential to save lives. WHO works with Member States across a range of activities, including coordination under the International Health Regulations (2005). Some of the important activities are:

Within 48 hours of an emergency, WHO

- Grades the severity of the event,
- Deploys field teams and activates global stockpiles of essential supplies, including personal protective equipment, medicines, and vaccines.
- Communicates the risk to the community and neighbouring countries through official International Health Regulations.
- Activates the Global Health Cluster, the Global Outbreak Alert and Response Network (GOARN), emergency medical teams and standby partners.
- WHO also develops new technologies to be able to detect and track new health events in the most difficult settings, such as the Early Warning, Alert and Response System (EWARS).
- Helps countries strengthen their public health surveillance system.
- Provides guidance on risk communications.
- Advises countries on establishing or accessing laboratory services.
- Enhances laboratory biosafety and biosecurity capacities.
- Increases domestic testing capacity in range and volume.

The WHO also supports Member States with the help of the World Bank, UNICEF, the World Food Programme and other partners to deliver universal health coverage and basic health services during these times. The WHO also deploys mobile medical teams and maintains stockpiles of essential supplies, life-saving medicines and personal protective equipment that can be dispatched quickly across the world. The WHO Emergency Medical Teams (EMT) Initiative also helps organizations and Member States build national capacities and stronger health systems so that countries have the ability to respond promptly when a disaster strikes or an outbreak flares.

Role of the **Indian Council of Medical Research (ICMR)**

The ICMR, New Delhi is one of the oldest medical research bodies in the world and apex body in India. This is the main national agency for the Planning, Formulation, Coordination, Implementation and Conduct or promotion of biomedical research in India.

For prevention and control of influenza outbreaks, ICMR Influenza Network was initiated in 2003. The influenza network collects clinical data, epidemiological data from patients with influenza-like illness (ILI) and severe acute respiratory infections (SARI) from several clinical virology setups in India. The surveillance database contains data on genetic characterization of the influenza viruses isolated. The network provides useful data for monitoring circulating influenza strains, detection of emerging/re-emerging viruses and defining seasonality in different geographical areas.

Thus, ICMR plays a very active role in monitoring and helps in predicting impending pandemics.

Indian Council of Medical Research is also coordinating “India COVID-19 Clinical Research Collaborative Network”. The goal of this network is to enhance the clinical understanding of Covid-19 in the country so as to develop specific clinical management protocols and further R&D for therapeutics. For this purpose, a central database of clinical and laboratory parameters of hospitalized Covid-19 cases is being created. All hospitals currently managing Covid-19 patients are invited to become partners in the network. ICMR also issues timely advisories required in testing and treatment of patients during pandemics.

Resources:

(1) Swetha G, Eashwar VM, Gopalakrishnan S. Epidemics and Pandemics in India throughout History: A Review Article. Indian Journal of Public Health Research & Development. 2019; 10(8):1570-6.
(2) https://www.ncbi.nlm.nih.gov/pubmed/30212163.
(3) Hughes JM, Wilson ME, Pike BL, Saylors KE, Fair JN, Le Breton M, Tamoufe U, Djoko CF, Rimoin AW, Wolfe ND. The origin and prevention of pandemics. Clinical Infectious Diseases. 2010 Jun 15; 50(12):1636-40.
(4) Daszak P. Anatomy of a pandemic. The Lancet. 2012 Dec 1;380 (9857):1883-4. The Lancet’s Zoonoses Series; http://www.thelancet.com/series/zoonoses.
(5) https://www.mphonline.org/worst-pandemics-in-history/

(6) WHO Global Influenza Preparedness Plan. The role of WHO and recommendations for national measures before and during pandemics, World Health Organization. 2005 (WHO/CDS/CSR/GIP/2005.5).
(7) https://www.who.int/activities/rapidly-detecting-and-responding-to-health-emergencies.
(8) https://www.who.int/activities/strengthening-national-emergency-preparedness.
(9) https://www.who.int/activities/accessing-essential-health-services-in-fragile-conflict-affected-and-vulnerable-settings.
(10) https://www.who.int/activities/building-a-skilled-workforce-to-respond-to-emergencies.
(11) Dasgupta, S., & Crunkhorn, R. (2020). A History of pandemics over the ages and the human cost. The Physician, 6(2). https://doi.org/10.38192/1.6.2.1.

Phase I: Module 1

Module 1.1
Infection Control Practices- Part I

Background:

Exposure to infectious organisms is a common phenomenon but development of disease following such exposures can be easily prevented by following certain practices that have been labelled as “Standard Precautions”. It has been shown in studies that students who receive education about standard precautions have a higher level of knowledge and comply better. Various studies along with “Patient Safety Module” by WHO strongly recommends incorporation of infection control modules in the curriculum of medical schools as medical students, the future doctors need to understand these concepts at an early stage to be able to incorporate them in their practice. The student must be taught scientific bases of these practices that can protect against infections both in community as well as hospital settings. The student should be taught about the basics of Infection control practices with emphasis on ability to use Personal Protective Equipment (PPE) optimally.

This module is aimed at enabling the learner to practise standard infection control practices including proper and consistent hand washing, use of PPEs and to familiarise with various disinfection and antiseptic procedures.

Competencies addressed

The student should be able to:	**Level**
Demonstrate proper hand washing	SH
Demonstrate Donning and Doffing of PPE	SH

Learning Experience

Year of study: Professional year 1

Hours: 4 hours

I. Interactive discussion – 1 hour
    a. Basics of infection and chain of transmission,
    b. Significance and ways of infection prevention,
    c. Role of hand in spread of infections and importance of hand hygiene in prevention of spread of infections,
    d. Components of standard precautions and use of PPE,
    e. Cough etiquette.

II. DOAP session on hand washing, use of gloves, mask, donning and doffing of PPE -1 hour

III. Visit to the hospital and discussion with the staff about the infection control practices followed by them - 1 hour

IV. Debriefing and Feedback - 1hour

Assessment

1. **Formative:** Viva can be used. This could be done immediately after the module and/or later with internal assessment.

   The technique of hand washing and donning & doffing of gloves can be randomly observed during conduct of practical sessions in first MBBS particularly in dissection halls. Peer feedback can also be incorporated.

2. **Summative:** Not required

Resources:

https://www.cdc.gov/infectioncontrol/training/infection-control.html.

Phase II: Module 2

Module 2.1
Infection Control Practices - Part II

Background:

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The basics of infection and components of the standard precaution have been covered in the first phase. The second phase student is better equipped to understand the details of transmission-based precautions as they now learn about the microbes along with disinfection and antiseptic procedures in detail. This is also the right time to introduce a student to the roles and responsibilities of an Infection Control Team in a hospital.

This module is aimed at enabling the learner to identify the most probable route of spread of a particular microbe causing infection and based upon that, identify which transmission-based precaution need to be adhered to along with standard infection control practices.

Competencies addressed

The student should be able to:	**Level**
Describe and discuss the implementation of airborne and contact precautions in a specific clinical situation	KH
Describe and discuss the functioning of institutional Infection Control Committee	KH

Learning Experience

Year of study: Professional year 2

Hours: 4 hours

I. Interactive discussion – 1 hour
   a. Revisit the various routes of spread of infections
   b. Need for isolation of patients in various circumstances
   c. Airborne and contact precautions including use of PPEs

d. Disinfection and antisepsis in patient care
e. Roles and responsibilities of infection control team

II. Small group case discussion followed by plenary– 1.5 hours

Example of Case study

Rajani, 34 years has returned home from Italy, at a time when that country is having an epidemic of a new virus infection. She has mild cough and sore throat. When she develops severe breathlessness, she is admitted in the general ward of the hospital. You have been asked to take a detailed history and examine the patient.

- What precautions are necessary in this case?
- What precautions are advised for the subordinate staff attending her?

III. Visit to the isolation ward in the hospital with discussion with the staff about the precautions they take - 1 hour

IV. Debriefing and Feedback - 0.5 hour

Assessment

1. Formative: OSCE, Viva, MCQ can be used.

2. Summative: OSCE, Viva, MCQ

Resources:

https://www.who.int/diseasecontrol_emergencies/training/m4_infection.pdf?ua=1

https://www.cdc.gov/infectioncontrol/training/infection-control.html.

Module 2.2
Emergence and Re-emergence of microbes

Background:

The serendipitous discovery of Penicillin by Alexander Fleming in 1928 made man dream about victory over microbes, but emerging and re-emerging infectious diseases have proven the futility of that dream and power of the microbes over man.

Emerging Infectious Disease (EID) are diseases that have been newly detected or were found only in restricted geographical locations with few cases. In contrast to this, **Re-Emerging Infectious Diseases** (REID) are diseases that were once major health problems and then their incidence declined to a great extent, but are again becoming health problems for a significant proportion of the population either globally or in a specific geographical location.

Incidence of these Emerging and Re-Emerging infectious diseases is increasing and there are a large number of factors that contribute to the origin or spread of these diseases which can increase the risk of Outbreaks or Pandemics dramatically. These factors can be related to the microbial properties, environmental, socio-economic, and demographic factors. Majority of the EID and REID are Zoonotic in origin and signifies the role of cohabitation in evolution of these organisms.

Keeping in mind the significance of understanding the factors that result in evolution of these infectious diseases and understanding mechanisms that can be adopted for prevention and control of these diseases a sound knowledge, skills and attitudes about Emergence and Re-emergence of microbes need to be developed in undergraduate medical students.

Competencies addressed:

The student should be able to:	Level
Define emerging and re-emerging infections. Explain reasons or Identify factors responsible for emergence and re-emergence of these infectious diseases.	K
Discuss strategies for early identification, prevention and control of emerging and re-emerging infectious diseases.	K
Discuss the challenges faced in control/ prevention of these infections	KH

Learning Experience

Year of study: Professional year 2

Hours: 6

i. Exploratory and interactive theory session- 1 hour

ii. Self study/ individual/ small group assignment about any one emerging or re-emerging infectious disease – 2 hours

iii. Discussion in small groups about reasons/ factors responsible for emerging or re-emerging infectious disease identified through case studies - 1 hour

iv. Plenary of findings in the case studies and closure - 2 hours

Assessment

1. **Formative:** Required, SAQ, MCQ, Viva Voce
2. **Summative**: Required

Resources:

1. Zumla A, Hui DS, (eds). Emerging and Re-Emerging Infectious Diseases, An Issue of Infectious Disease Clinics of North America E-Book. Elsevier Health Sciences; 2019 Nov 2.
2. Lessler J, Orenstein WA. The Many Faces of Emerging and Re-emerging Infectious Disease. Epidemiologic reviews. 2019 Nov 4.

Module 2.3
Diagnostic tools

Background:

Diagnostics are a fundamental component of successful outbreak containment or control strategies, being involved at every stage of an outbreak, from initial detection to eventual resolution. Each individual pathogen presents specific diagnostic challenges.

Pandemics are caused by either emergence or re-emergence of microbes. In case of re-emergence, availability of validated diagnostic protocols and tools make laboratory confirmation of the cases easy but this is not the case when we have newly evolved microbes causing pandemic. The laboratory diagnostic tests are either not available and if available, they need to be validated and their performance characteristics like sensitivity, specificity, positive predictive and negative predictive value studied before they can be used for diagnosis. The health care professionals are faced with various dilemmas at these times which can range from a very basic query like the best time and best sample that needs to be collected, to sensitivity and specificity of a chosen procedure that can be isolation of microbes, antigen or antibody detection or gene that needs to be detected in molecular diagnostics.

Thus, the questions are innumerable and it becomes important to train a medical student to deal with such dilemmas in the diagnosis of an infection particularly during pandemics. They must be taught to choose and collect the most appropriate clinical sample in a suitable container with/without transport media, at the most appropriate time from a suspected case during pandemic and interpret the results of the test keeping in mind various performance characteristics and validation requirements.

Competencies addressed:

The student should be able to:	Level
Describe specimen selection, collection, transportation & storage requirement during a pandemic.	KH
Choose and collect the most appropriate clinical sample in a suitable container at the most appropriate time from a suspected case during pandemic (or in a simulated environment).	SH
Demonstrate appropriate safety measures in handling and processing of clinical specimens (use of PPE etc.)	SH
Discuss various diagnostic modalities available for an infectious disease. Explain sensitivity, specificity, positive predictive value & negative predictive value of each of the diagnostic test/modality.	KH
Chose the most appropriate diagnostic test keeping in mind sensitivity, specificity, positive & negative predictive value of the diagnostic test/modality available.	SH

Learning Experience

Year of study: Professional year II

Hours: 6

i. Exploratory and interactive theory session- 1 hour

ii. Sample collection demo and hand on in skill lab- 1 hour

iii. Visit to laboratory with demonstration of diagnostic test-1hour

iv. Small group activity, where students can be asked to discuss different test reports of suspected cases with performance characteristic and asked to interpret followed by discussion on choosing a lab test– 2 hours

v. Discussion and closure - 1 hour

Assessment

1**. Formative:** Required by assignments, OSPE, viva

2. **Summative:** Required by OSPE, SAQ, MCQ

Resources:

1. Kelly-Cirino CD, Nkengasong J, Kettler H, et al**.** Importance of diagnostics in epidemic and pandemic preparedness**.** BMJ Global Health 2019;4: e001179.
2. J Michael Miller, Matthew J Binnicker, Sheldon Campbell, Karen C Carroll, Kimberle C Chapin, Peter H Gilligan et al. A Guide to Utilization of the Microbiology Laboratory for Diagnosis of Infectious Diseases: 2018. Update by the Infectious Diseases Society of America and the American Society for Microbiology, *Clinical Infectious Diseases*, Volume 67, Issue 6, 15 September 2018, Pages e1–e94.
3. Washington JA. Principles of Diagnosis. In: Baron S, editor. Medical Microbiology. 4th edition. Galveston (TX): University of Texas Medical Branch at Galveston; 1996. Chapter 10. Available from: https://www.ncbi.nlm.nih.gov/books/NBK8014/.

Module 2.4

Vaccination strategies including vaccine development & Implementation

Background:

Virulent agent, susceptible host and favourable environment forms the epidemiological triad for all infectious diseases in all settings. The disease can be controlled by addressing any of these components. If available, an effective vaccine can be very useful in breaking the chain of transmission quickly as host will no longer remain susceptible. Given the ease of logistics and quickness of action, vaccine has been looked upon as a potential saviour in situations of epidemics and pandemics especially in diseases caused by viruses. In fact, world owes it to vaccines, for the eradication of Smallpox and control of Polio and Measles. However, the development of vaccines is a long and tedious process, which takes several months to years. Also, equally important is to develop a rational strategy for use of vaccine for any illness. Usually there is undue pressure from communities and administrators for use of vaccines as ad-hoc measure. As a trained medical personnel, the Medical Officer should be able to guide them on this issue sensibly. Also, the Medical Officer should be vigilant to the generalized complacency that follows in the diseases known to have vaccine available. This module will focus on empowering the students to develop sound and rational knowledge about vaccines, vaccine development process and their role in small and large disease outbreaks.

Competencies addressed:

The student should be able to:	**Level**
Describe the process of vaccine development.	KH
Describe the role of vaccines in disease control and eradication.	KH
Describe the steps to prepare a micro plan for vaccination activity at PHC level.	KH
Describe the importance of routine vaccination during pandemics.	KH
Describe the role of communities in vaccination programmes.	KH
Describe the cold chain for vaccine storage and delivery.	KH

Learning Experience

Year of study: Professional year 2

Hours: 6

i. Exploratory and interactive theory session- 30 min.
ii. Small Group Discussion- 3 hrs.

Suggested Topics for discussion: Vaccines in Disease Control, Vaccine Development Process, Routine Vaccination during Pandemic & Pandemic Influenza Vaccines -WHO.

iii. Visit to PHC/ local hospital to show cold chain and sample micro-planning for Supplementary Polio Vaccination [Interaction with Medical Officer] -2 hrs.
iv. Discussion and closure – 30 min.

Assessment

1. Formative: Required- assignment, MCQ, SAQ

2. Summative: Short Answers, Short Notes

Resources:

1. Pandemic influenza vaccines: WHO. Available from: https://www.who.int/immunization/newsroom/vaccine_PI/en/
2. Vaccine Testing and the Approval Process- Centre for Disease Control, USA. Available from: https://www.cdc.gov/vaccines/basics/test-approve.html
3. Immunization Handbook for Medical Officers. National Health Mission. 2017. https://nhm.gov.in/New_Updates_2018/NHM_Components/Immunization/Guildelines_for_immunization/Immunization_Handbook_for_Medical_Officers%202017.pdf
4. Vaccination in Humanitarian Emergencies: Literature review and case studies. Available from: https://www.who.int/immunization/sage/meetings/2012/april/2_SAGE_WGVHE_SG1__Lit_Review_CaseStudies.pdf

Module 2.5
Therapeutic strategies including new drug development

Background:

In many pandemics, causative organisms may not be identified in the beginning. Even when identified, it is likely that a specific drug may not be available. However, persons with illnesses will have to be taken care of. This includes general care, supportive care, early recognition and management of complications. Many drugs which are already being used for existing indications may be used as 'off label'. The knowledge of biochemical features, enzymes, receptors, co-receptors, facilitating and inhibiting molecules may help one in postulating and verifying the use of some existing molecules. Considering the major role of immune mediators in disease pathogenesis and that of immunity in the elimination of the organism, various immune-modulators may also be considered in the management at various stages. Some of these molecules may also be used for prophylaxis in exposed persons or for primary prophylaxis in susceptible populations.

The development of a molecule, identifying its effects and detecting toxicities and side effects needs to be done systematically. Before release, any molecule has to undergo phase 1, 2 and 3 trials. Almost always this is done in animals and human volunteers. Post marketing trials also may lead to new observations. However, these steps which generally require long time lags may have to be shortened during a pandemic situation. Many drugs which show good effects may be discarded, as time passes. Experiences with one pandemic in one part of the globe may not be applicable to another. This module helps the learner to understand the pharmacologic approach to a pandemic situation.

Competencies addressed:

The student should be able to:	Level
Describe and discuss the various phases of drug trials	KH
Prepare a plan for evaluation of off label use of a drug	SH
Organise pharmaco-vigilance activities	SH
Discuss ethical aspects of clinical trials in pandemics	SH

Learning Experience

Year of study: Professional year 2

Hours: 6

i. Exploratory and interactive theory session- 1 hour
ii. Small Group Discussion- 2 hours

Suggested Topics for discussion- New Drug Development – Challenges and Solutions – Urgency in procedures – Need for monitoring.

iii. Visit to a pharmaceutical firm/ pharmacy lab to show various stages of drug development or an ADR monitoring exercise in clinical wards - 2 hours. (since it is not present in many cities - an appropriate video followed by discussion)
iv. Discussion and closure – 1 hour

Case study

1. During the beginning of the Covid-19 epidemic, various drugs were tried in different parts of the globe at various stages of the epidemic. Some of them are off label use of existing drugs, some are extrapolations based on molecular features of the virus. Discuss how you would reach a conclusion and explain to the authorities.
2. There is a pandemic caused by an unknown virus. Someone has come with a claim that a plant extract can be used to prevent and treat this infection.

Describe and discuss how you will proceed to identify any benefit from such an attempt.

3. A group of persons who have taken a tablet for prevention of infection during a pandemic develops a skin eruption. How will you establish any linkage between the drug and the new manifestation or conclude that this is a new manifestation that is just being recognised.

Learning Points

a. Various phases of clinical trials
b. Compliance with regulatory authorities
c. Exploration of off label uses and new molecules for therapy
d. Pharmaco-vigilance measures.

Assessment

1. **Formative:** SAQ, Viva
2. **Summative:** SAQ, Viva

Phase III: Part 1

Module 3

Module 3.1
Outbreak management
including quarantine, isolation, contact tracing

Background

Outbreak management is one of the most important duties for all health care providers concerned with public health. To manage outbreaks, first we must investigate the outbreak to find out answers to what, where, when and who are affected and also as far as possible trace the source which may help us to suggest control measures so that we can contain the outbreak.

Competency addressed

The student should be able to:	**Level**
Demonstrate the ability to conduct various epidemiological investigation related to pandemics - Level (or in a simulated environment)	SH

Learning experience

Year of study: professional Year 3

1. Introduction of case scenarios (4) -1 hour
2. Self-directed learning -1 hour
3. Interactive Lecture – 1 hour
4. Preparation of epidemic curve, spot map and calculating attack rate from a given data
5. Discussion and closure- 1 hour

Case scenario 1

Mr. X, Medical Officer of a primary health centre noticed increased number of cases with symptoms of fever, sore throat and cough during third week of March. While taking detailed history one patient had a history of international travel 2 weeks back from a place where some of his friends also had similar illness. In the next week, one of the tertiary care hospitals in the city reported increased number of severe acute respiratory illness among admitted patients and two of them died due to this.

As a Medical Officer or a member of a district health care team, how do you investigate this and manage the situation?

Case scenario 2

Dr. X was appointed as Medical Officer of the Primary Health Centre. One of his field staff reported three cases of watery diarrhoea and dehydration (two mild and one severe) in his field area and he referred them for admission to the hospital.

As a health professional what do you think about this episode and how do we proceed to investigate and control the situation.

Case scenario 3:

Dr. X was on casualty duty that day. Mr. Y, 49 years old, presented to Medicine casualty with high grade fever (3 days), retro-orbital pain, myalgia and rash. While eliciting detailed history from the patient, he revealed that there was history of fever and body ache for his brother and brother's wife one week back for which they took treatment in a private hospital. Mr. Y and his four brothers lived in nearby houses in the same compound (within 300 metres). He took paracetamol on the first two days of fever thinking that he was feverish as he walked in the rain the previous day.

As a health professional what do you think about this episode and how do we proceed to investigate and manage the situation.

Case scenario 4:

Mr. A,17 years old, was brought to Medicine casualty with history of headache, myalgia and vomiting in the past 2 days. He reached home only 4 days back after a tour along with 13 friends. The day after he came home, he had mild fever and body ache. He thought it might be due to tedious travel and took rest at home. But last night his friend phoned him and said that one of their friends was taken to hospital following fever, vomiting and loss of consciousness.

As a health professional what do you think about this episode and how do we proceed to investigate and manage the situation.

Learning Points

a. Define terms: outbreak, epidemic, pandemic.

b. How to detect / recognise an outbreak- warning signs of an impending outbreak - Steps of outbreak investigation
c. Describing the event in terms of time, place and person and importance of epidemic curve, spot map and attack rate.
d. Responses at different levels – general and specific measures include reservoir control, breaking the chain of transmission and protecting the at-risk group.
e. Differentiate between isolation and quarantine.
f. Role of contact tracing in outbreak control.
g. If it is a new disease, gaps will be there, so to fill the gap research activity is required.

Assessment

1. **Formative:** conducting clinic-social discussion based on a scenario, short answer questions, OSPE response station.
2. **Summative:** modified essay/ short question on steps of outbreak investigation, OSPE response in practical.

Discussion

Definition of an outbreak/ epidemic:

An **outbreak or epidemic** is defined as the occurrence in a community or region of cases of an illness clearly in excess of expected numbers. Usually an outbreak is limited to a small focal area, an epidemic covers large geographic area and has more than one focal point. **Pandemic** is defined as an epidemic occurring world-wide or over a very wide area crossing international boundaries and usually affects a large number of people.

Warning signs of an impending outbreak

- Clustering of cases or deaths in time and /or place,
- Unusual increase in cases or deaths,
- Even a single case of measles, AFP, Cholera, plague, dengue or JE,
- Acute febrile illness of unknown aetiology,
- Occurrence of two or more epidemiologically linked cases of meningitis,
- Shifting age distribution of cases,
- High or sudden increase in vector density,
- Natural disasters.

Detecting an outbreak

1. **Rumour register:** it has to be maintained in each public health facility for collecting information related to infectious diseases. There are key informants in the community like teachers, Anganwadi workers (AWW), ward members, Self-help Group (SHG), Youth club leaders, etc. They are the eyes and ears of health services in the community
2. Media – an important source of health information
3. Review of routine data
4. Through strict vigilance on warning signs of impending outbreak

Steps of outbreak investigation:

1. **Verification of the diagnosis**: The first and foremost step in outbreak investigation would be to verify the diagnosis. A clinical examination along with laboratory investigations of a sample of cases may be sufficient for this, but the epidemiological investigation should not be delayed until laboratory results are available.
2. **Confirmation of existence of an outbreak**: For this, Medical Officer should check
    - If there is an abnormal increase in the number of cases, or
    - See there is clustering of cases, or
    - If the cases are epidemiologically linked, or
    - If some trigger events have occurred, or
    - If many deaths have occurred.

    An arbitrary limit of two standard errors from the endemic occurrence is used to define epidemic threshold for common diseases like influenza. If there is evidence of an outbreak, and if the aetiology, source and route of transmission are known, specific control measures need to be initiated immediately. If anyone of the above is unknown, the outbreak must be investigated to identify the specific cause. The Rapid Response Team (RRT) which was formed during the phase of epidemic preparedness should be alerted and requested to further

investigate the outbreak. At the same time general control measures should be started.

3. **Defining population at risk:** before starting investigation, it is necessary to have the attack rates.
4. **Rapid search area map and age gender distribution of entire population in the area.** This is essential for calculating for all cases and their characteristics: this is to identify all cases including those who have not sought medical care and those possibly exposed to the risk.

   For this, we can use a carefully designed epidemiological case sheet. The information collected should be relevant to the disease under study. Based on the information collected from the affected ones, search for more cases and their contacts should be continued. Laboratory investigations are done with the help of microbiologist. Microbiologist may advise on what samples are required, mode of collection and transport and also the laboratory to which these are to be sent. Entomological investigation should also be done if the outbreak warrants it.

5. **Data Analysis:** Data collected should be analysed to identify common event or experience using the epidemiological parameters like time, place and person.
   Time: Epidemic curve can be constructed based on chronological distribution of dates of onset and number of cases. It may suggest a time relationship with exposure to a suspected source, whether it is a common source or propagated epidemic, whether it is of a seasonal or cyclic pattern.
   Place: A spot map is prepared with cases in relation to possible source of infection. Clustering may suggest common source of infection.
   Person: Analyse the data by age, sex, occupation, and other risk factors. Find out attack rates/ case fatality rates for those exposed and not exposed. In food borne epidemic, food specific attack rates are calculated.

6. **Formulation of hypothesis:** on the basis of time, place and person analysis, hypothesis is formulated to explain the epidemic in terms of possible source, causative agent, possible modes of spread, people at risk and the environmental factors

7. **Testing the hypothesis:** If the hypothesis fits with the facts, response measures can be initiated; otherwise, further analytical investigation in terms of case control studies will need to be carried out. In the meantime, general control measures are carried out.
8. **Evaluation of ecologic factors:** This is to prevent further transmission of disease. Ecologic factors include sanitary status of eating establishments, water and milk supply, break down in water supply, population movements, atmospheric changes, population dynamics of insects and animal reservoirs.
9. **Further investigation of population at risk**: To obtain additional information, for e.g. serological study may reveal clinically in-apparent cases and throw light on the pathogenesis of the condition.
10. **Writing the report:** This can be an interim report which includes details of the investigation, the diagnosis and control measures initiated. Once the outbreak is coming under control, we should make follow up visits to see whether control measures are implemented adequately and also help to collect new information which was missed in the previous visits. The final report is given within 10 days of the outbreak being declared to be over. The outbreak is declared over when there are no new cases for a period of two incubation period since the onset of last case.

Responses to an outbreak

1. **General measures is** till the specific source and route of transmission is identified. For example, if one is suspecting a droplet infection outbreak, start a campaign requesting people to follow social distancing, use of mask and hand hygiene.
2. **Specific measures** depend on the causative agent. The broad steps are:
    - Identification and nullification of the source of outbreak like chlorinating wells,
    - Minimising transmission to prevent further exposure: vector control,
    - Protection of the host- immunization / chemoprophylaxis,
    - Controlling the reservoir include early diagnosis, notification, isolation, treatment, quarantine.

Isolation: Separation **of infected** persons or animals **for the period of communicability** from others in such places and conditions as to prevent or limit the direct or indirect transmission of infectious agent from those infected to those who are susceptible. Purpose is to protect the community by preventing transfer of infection from the reservoir to the possible susceptible host.

Quarantine: Limitation of freedom of movement **of healthy person** or domestic animals exposed to communicable disease for **a period not longer than the longest usual incubation period** of the disease to prevent contact with those not so exposed.

Contact tracing: The process of identifying, assessing and managing people who have been exposed to a disease to prevent onward transmission. When systematically applied, this will break the chain of transmission of an infectious disease and is an effective tool in public health. This has to be explained according to the scenario provided.

Resources:

1. Park's Textbook of Preventive and social medicine - 25th edition-published by Banarasidas Bhanot-2019.
2. Medical officer's manual on Integrated Disease Surveillance Project by National institute of Communicable Diseases, DGHS, GOI 2006.

Module 3.2

Interdisciplinary collaboration, Principles of Public Health Administration, Health Economics

Background:

When an outbreak is suspected as given in the case scenarios of previous module, interdisciplinary collaboration is essential. Inter-sectoral coordination is one among the four principles of primary health care. To ensure this, the outbreak control team or multidisciplinary team is convened to conduct the investigation in the field for confirming the outbreak and taking measures for preventing the spread of disease. The powerful public health administration which aims equity, use of appropriate technology, community participation and inter-sectoral coordination is our strength. While managing an outbreak we would understand that many of the determinants of health lie outside the domain of Health Department. Provision of safe drinking water, sanitation, nutrition, legal measures for imposing strict interventions, good house and shelter are some examples. This also points towards the importance of interdisciplinary collaboration. Members of the community should have all the rights to participate in their duties towards controlling an outbreak.

Competency addressed

The student should be able to:	Level
Demonstrate the ability to conduct various epidemiological investigation related to pandemics (need clarity on simulated environment).	SH

Sub competency

Demonstrate the ability to form interdisciplinary team for conducting outbreak investigation.

Learning objectives

The learners should be able to:

1. List the four principles of primary healthcare,

2. Describe the scope of inter-sectoral coordination in outbreak control,
3. List the members of inter-sectoral team for outbreak investigation,
4. Describe the activities of inter-sectoral team in each case scenario provided,
5. Demonstrate the formation and meeting of Rapid Response Team (RRT) as role play according to the case scenarios.

Learning experience

Year of study: professional Year 3

1. Introduction of topic based on previous case scenario -1 hour
2. Self -directed learning -1 hour
3. Interactive Lecture – 1 hour
4. Role play on forming RRT- 1 hour (based on one case scenario)
4. Discussion and closure- 1 hour

Learning Points

a. Inter-sectoral coordination as one among the four principles of primary health care,
b. The role of inter-sectoral coordination in outbreak management,
c. How this can be applied in all four case scenarios,
d. Who are included in the outbreak investigation team and what are their roles and responsibilities?
e. What is health economics? What is the impact of epidemic/pandemic on economic status of the family/ state/country?
f. Cost effectiveness of interventions/ actions to control epidemic.

Assessment

1. **Formative**: theory examination -as short questions /practical – group viva voce.
2. **Summative**: modified essay/ short question on role of inter-sectoral coordination in epidemic management, practical - viva voce.

Discussion points

Inter-sectoral coordination: It is a fact that health care cannot be provided by the health sector alone. While managing outbreak we realise that many of the determinants

of health are outside the domain of health care. Hence inter-sectoral coordination as one among the four principles of primary health care is worth mentioning. The other areas closely related to health are agriculture, animal husbandry, food, industry, education, housing, public works, communication etc. To ensure such coordination, administrative system should take the lead with suitable legislation and strong political will. Proper planning should be there to avoid duplication of activities.

In the event of a suspected outbreak, the Rapid Response Teams (RRT) which is a multidisciplinary team that looks into various aspects of an outbreak is alerted and meeting is convened. The team includes an epidemiologist, clinician, microbiologist and other specialities and sectors as per requirements (described earlier). The main role of RRT will be to investigate and confirm outbreak. The members of RRT are regularly doing their work but, in the event of an outbreak, come together to undertake a special function. They should work in coordination with the Government health staff. They will help and support health staff in management and control of outbreak but the responsibility of implementing control measures mainly rests with local health staff. RRT should be formed at all levels of administrative system (district, block, Panchayath). The name, address and mobile phone number of RRT members should be available at respective levels so that they can be alerted as soon as possible.

Health economics: Health economics as a branch of economics, is concerned with issues related to efficiency, effectiveness, values and behaviour in the production and consumption of health and health care. Pandemics may affect a large population across borders and nobody can predict when it ends, especially if it is a new disease without vaccine or treatment. So, we are forced to implement other measures like isolation, quarantine and complete lock-down to save the lives of the people. But, at the same time globally we have to face economic crisis due to reduction in gross domestic product (GDP) due to loss of life, workplace closures and quarantine measures.

Economic evaluation can be done as the comparative analysis of alternative course of action in terms of both their cost and consequences. Methods can be cost-benefit analysis (in monetary terms) and cost-effective analysis (in natural units).

The Epidemic Diseases Act, 1897 (ANNEXURE I)

One of the shortest legislations in India, The Epidemic Diseases Act has four sections. It is aimed at 'providing for better prevention of the spread of Dangerous Epidemic Diseases'. The Act was first enacted in the British colonial era primarily to control the Bubonic Plague outbreak in the late 1800s. It has remained relevant ever since.

Section 2A of the Act allows the Centre to prescribe regulations to inspect any ship or vessel leaving or arriving in any port and to detain any person planning to leave or arrive into India.

The Government's decisions on restricting international and domestic travel to and from India fall under the provisions of this Act.

The Act also empowers State Governments under Section 2(1) to prescribe Regulations with respect to any person or group of people to contain the spread of Covid-19.

Penalty

Section 3 of the Epidemic Diseases Act, 1897 gives the penalties for violating the Regulations. Section 188 of the Indian Penal Code states that it will be six months imprisonment or Rs. 1000 fine or both.

The Disaster Management Act, 2005 (ANNEXURE II)

The Disaster Management Act was enacted to tackle disasters at both Central and State Government levels.

Section (2) defines a disaster as a "catastrophe, mishap, calamity or grave occurrence in any area, arising from natural or man-made causes". **On March 14, 2020 the Central Government termed Covid- 19 as a 'notified disaster' as a "critical medical condition or pandemic situation".**

The Act enables the Centre and States to enforce a lock-down and restrict public movement. It allows the Government to get access to the National Disaster Response Fund, the State Disaster Response Fund and the District Disaster Response Fund. It also has provisions for allocation of resources for prevention, mitigation, capacity building etc.

The Penalties

Sections 51 to 60 of the Act prescribes the penalties for the violators.

The Law describes the offence as obstructing any officer or employee from performing their duty or refusing to comply with directions. Violators can be jailed for up to 1 year or fine, or both. In the case of dangerous behaviour, the jail term can be extended to two years.

Resources:

1. Park's Textbook of Preventive and social medicine - 25th edition: published by Banarasidas Bhanot -2019.
2. Medical officer's manual on Integrated Disease Surveillance Project by National Institute of Communicable Diseases, DGHS, GOI 2006.

Module 3. 3:
Operational research, field work, surveillance

Background

Operational research is the discipline that uses statistics, mathematics, computer modelling and similar science models for decision making. It is a potential tool for use in many areas that demands evidence-based or model-based decision making. One such area is the epidemic/ pandemic management but it is used less frequently. The reason for its limited use may be because of low awareness among the specialist community. In the era of frequent epidemics, it is the need of the hour to sensitize undergraduate medical students of today (health professionals of tomorrow) about operational research and its use in epidemic management.

Another important area is surveillance which is the backbone of public health programmes and provides information on public health events so that effective action can be taken in controlling and preventing disease outbreaks. The course of an epidemic depends on how early it is identified and how effectively specific control measures are applied.

Competency addressed

The student should be able to:	**Level**
Demonstrate the ability to conduct various epidemiological investigation related to pandemics (or in simulated environment)	SH

Sub-competencies addressed

1. Demonstrate the ability to appreciate the need of operational research in epidemic control.
2. Demonstrate the ability to identify syndromes and underlying diseases in the given scenario and suggest control measures.

Learning experience

Year of study: professional Year 3

1. Introduction of topics based on previous case scenario -1 hour
2. Self –directed learning -1 hour
3. Interactive Lecture – 2 hours (surveillance, operational research)
4. Discussion and closure- 1 hour
5. Visit to PHC/sub-centre and field area along with field staff of sub-centre -3 hours

Points to be discussed

a. What is operational research?
b. The role of operational research in outbreak management,
c. How this can be applied in all four case scenarios,
d. What is public health surveillance, its key elements and uses of surveillance in outbreak prevention,
e. Integrated Disease Surveillance Project (IDSP) – syndromes and core conditions in IDSP, types of surveillance, data collection methods,
f. How surveillance activity is carried out in peripheral institution (SC/PHC) as per IDSP
g. What are the field activities and how data is collected, compiled, analysed and reported?

Assessment

1. **Formative:** theory examination –as short questions /practical – viva voce
2. **Summative**– modified essay/ short question on role of operational research in epidemic management, Public Health Surveillance, practical – viva voce.

Discussion points

Operational research (OR): is the discipline that uses statistics, mathematics, computer modelling and similar science methodology for decision making. This is helpful in many areas especially outbreak management activity that requires evidence-based or model-based decision making. Operational research can address important issues in epidemic management like how to allocate resources among options for a

better control of epidemic, what resources are needed to control an outbreak and which resources should be employed for the same.

Analytical computer-based models are used for plotting and forecasting epidemics. Advanced models with quantitative analysis are used for quantifying exposure and forecasting resources needed. Decision making techniques are used to help policy makers to set up policies. It is again a multi-disciplinary approach which requires team activity of OR/ statistics researchers, epidemiologist, managers, physicians, microbiologists etc. which help staff dealing with Statistics to better understand the nature of the epidemic and that is reflected in predictive accuracy of models. At the same time, epidemiologists will be more involved in OR and modelling which help them to better manage outbreaks.

Public health surveillance: Surveillance is defined as ongoing systematic collection, collation, analysis and interpretation of data and dissemination of information to those who need to know in order that action can be taken. In simple words, it is a data collection for action. We already have a system of decentralized state-based surveillance program in the country named as **Integrated Disease Surveillance Project (IDSP)**. This is the back bone of public health program as it provides information so that timely action can be taken in controlling and preventing diseases/ outbreaks.

Key elements of surveillance system are:

- Detection and notification of health event,
- Investigation and confirmation (epidemiological, clinical, laboratory),
- Collection of data,
- Analysis and interpretation of data,
- Feedback and dissemination of results,
- Response – a link to public health program as action for prevention and control

Uses of surveillance in outbreak control and prevention:

- Recognize cases or cluster of cases to trigger interventions to prevent transmission or reduce morbidity and mortality,

- Identify high risk groups or geographical areas to target interventions and guide analytic studies,
- Demonstrate the need for public health intervention programs and resource allocation during public health planning,
- Monitor effectiveness of prevention and control measures.

Core conditions under surveillance:

- Regular surveillance: vector borne diseases, water borne diseases, Respiratory diseases, vaccine preventable diseases, disease/s under eradication, other conditions (RTA), international commitments, Unusual clinical syndromes.
- Sentinel surveillance: Sexually transmitted disease/ blood borne, other conditions (water quality, outdoor air quality.
- Regular periodic surveillance: NCD risk factors, State specific diseases (Dengue, JE, Leptospirosis).

Types of surveillance in IDSP

Syndromic: Diagnosis made on the basis of symptoms/ clinical pattern by paramedical personnel and members of the community.

Presumptive: Diagnosis made on typical history and clinical examination by Medical Officer.

Confirmed: Clinical diagnosis confirmed by laboratory test.

Major syndromes and (conditions) given under IDSP

- Acute watery diarrhoea – (Cholera),
- Fever <7 days duration- only fever (malaria), fever with rash (Measles/Dengue), altered consciousness (Japanese encephalitis), fever with bleeding (Dengue), with convulsions,
- Fever > 7 days– (Typhoid),
- Jaundice- (Hepatitis),
- Cough >3 weeks,- (Pulmonary Tuberculosis),
- Acute flaccid paralysis - (Poliomyelitis),
- Unusual event?

Data collection methods

- Routine reporting – passive surveillance
- Sentinel surveillance
- Active surveillance
- Laboratory surveillance
- Outbreak investigation

PHC / sub-centre visit– interacting with Medical Officers of PHC and field staff about surveillance activities going on there as part of IDSP. Also getting acquainted with different registers and reporting formats for all three types of surveillance (syndromic, presumptive, Laboratory).

Field area visits with field staff to acquire skills of data collection methods, recording, analysing and reporting.

Resources:

1. Park's Textbook of Preventive and social medicine - 25th edition published by Banarasidas Bhanot-2019.
2. Medical Officer's Manual on Integrated Disease Surveillance Project by National Institute of Communicable Diseases, DGHS, GOI 2006.

Phase III: Part 2

Module 4

Module 4.1
Care of patients during Pandemics

Description:

During any pandemic, infected persons can be divided into three categories. Asymptomatic persons, mildly symptomatic, Advanced disease. Epidemiologically all symptomatics can also be classified as suspected, probable and confirmed. Most infected persons in most infections tend to be asymptomatic but infective to others. They are usually not picked up unless there is substantial active surveillance mechanisms in place. If all contacts are kept under observation or in quarantine and they are regularly screened, the asymptomatic persons can be picked up in large numbers.

The patients who come to the hospital are mostly symptomatic. Some of them may be serious enough to be hospitalised and some may need intensive care. They are usually graded as mild, moderate and severe, based on clinical finding and prognosis. The progression from mild to moderate and severe will depend on many factors.

The Institutional approach to a person reaching the health system includes proper triaging with the purpose of recognising and restricting the potential for transmission of infection to others, recognising bad prognostic signs and early institution of care depending on the presentation. All health care workers at the triage point should be aware of the specific information that needs to be elicited (e.g. travel history) and the bad prognostic indicators (symptoms and signs). In many illnesses, contact / airborne precautions must be initiated in the triage area itself and unnecessary movement of patients and close associates must be restricted too.

The clinical management of patients during pandemics must be based on specific protocols/ guidelines from immediate higher authority. This should be evidence-based and as per standard practices recognised. Extreme care should be taken to

document all history and other epidemiologic evidences, however subtle they may be. All activities should be properly documented and communicated to higher authorities as required. The treatment can be divided into non-pharmacologic interventions (like isolation, nutritional support), supportive care, specific management (if any), recognition and management of complications and prevention.

Competencies addressed

The student should be able to:	**Level**
Describe and discuss the triage facilities required for persons during epidemics	KH
Demonstrate the role of IMG in triage and referral	SH
Demonstrate the ability to manage a suspected / confirmed case in the emergency room during a pandemic	SH

Case study

There is some news about an unknown disease spreading in the town. An ambulance stops in front of your clinic. A group of 05 persons immediately jump out and rush to transport the patient to the emergency room. Mrs. Gracy, 65 years suffering from cough and breathlessness, is carried by four persons to the clinic. One among the group of doctors examines the patient and requests the nurse to arrange for a Chest X-ray and Blood Glucose estimation. Another doctor records the blood pressure. A third person tries to do a venesection. The patient is sent to the Radiology department. The patient develops breathlessness and syncope while returning to the emergency room.

- How should the emergency room prepare to receive a suspect case during an emergency?
- How can such a situation be handled better and safely during an outbreak?
- What precautions should be taken while patient is transported during an outbreak?

Learning Points

- Principles of Triage during epidemics,
- Precautions and care to be made while transporting a person with infections,
- Responsibility to other health care workers while a person with infection is cared.

Learning Experience

Year of study: Professional year Phase III Part 2

Hours: 6 hours

a) Interactive discussion – 2 hours
    i. Triage practices to be followed in a clinic / hospital
    ii. Primary care to be given to a patient on reaching the hospital
    iii. Steps to be taken to reduce transmission of infections in emergency area.

b) Role play to highlight the various roles to be played in emergency area - 1 hour
c) Visit to the hospital with discussion with staff about the practices followed - 2 hours
d) Debriefing and Feedback - 1hour

Assessment

1. **Formative:** DOPS, Viva can be used. This could be done immediately after the module and/or later with internal assessment.
2. **Summative:** not required

Module 4.2
Emergency Procedures during Pandemics

Description:

During outbreaks of illnesses, many patients can develop life-threatening complications. This is more common among persons of extreme age (children and elderly), depending on the pathogen. It is also likely to be more common among persons with co-morbidities as well. These co-morbidities may also make them vulnerable to dangerous events. Toxin or cytokine-mediated damage, metabolic causes, coagulation abnormalities, sepsis etc. can cause multi-organ dysfunction quickly. Persons may develop respiratory, cardiac, renal or neurological events. Proper and timely intervention can prevent further deterioration or even reverse the situation. The IMG should demonstrate required competencies to perform certain procedures. These may include endotracheal intubation, ventilation, cardiopulmonary resuscitation, tracheostomy, to name a few. All situations demand extreme care to be adopted to protect the health care worker involved in such procedures as well. Beyond the skills that are necessary to perform these psychomotor procedures, the IMG should also have the knowledge, attitude and communication skills to manage such a situation.

Competencies addressed

The student should be able to:	**Level**
Demonstrate the ability to perform life-saving interventions during outbreaks, ensuring safety of HCWs	SH

Case study

Mr. Joseph, 72 years old, has been admitted with a febrile illness, one week after a foreign trip at a time when a pandemic had been declared in the country he visited. He is being managed in an isolation room with all airborne precautions. The nurse notices that he has suddenly developed breathlessness and is tachypnoeic. The

oxygen saturation by pulse oximetry is only 70%. The duty doctor has found crackles all over the lung fields and mild cyanosis. The relatives are planning to take him home on their own. The doctor is called in by an emergency call.

- What are the steps that can be taken immediately to ensure a better survival for him?
- What are the factors influencing the decision to do any invasive procedure?
- How will you discuss the issues with the relatives?

Learning points

1. The type of emergency procedures required in various emergencies,
2. The logistics and infrastructure facilities and prioritisation to be considered,
3. The aspects related to communication with the relatives,
4. The immediate, short-term and long-term care of such persons in Intensive care.

Learning Experience

Year of study: Professional year Phase III Part 2

Hours: 8 hours

I. Interactive Discussion – 2 hours
    1. Indications for invasive procedures in Pandemics
    2. Points to be verified before emergency procedures
    3. Steps to be taken to reduce transmission of infections
    4. Attitude and Communication Issues related to complicated procedures

II. Skill development program – with mannequins e.g. intubation, CPR, ALS, PALS etc - 4 hours *(This may be linked with the routine Skill training component as well)*

III. Role Plays for communication skills and documentation - 1 hour

IV. Debriefing and Feedback -1hour

Assessment

1. **Formative:** OSCE, DOPS, Viva can be used. This could be done immediately after the module and/or later with internal assessment
2. **Summative:** OSCE, Viva, SAQ, MCQ

Module 4.3
Managing Death during Pandemics

Description:

During outbreaks of illnesses, many patients may expire, due to various causes. This is more common among persons of extreme ages (children and elderly) depending on the pathogen. It is also likely to be more common among persons with co-morbidities as well. These co-morbidities may also make them vulnerable to death as well. The inevitable consequence of death during pandemics must be handled with extreme caution. The management may start from the time the person becomes sick or is brought in a moribund condition. Death may be unexpected or even expected at times. Many procedures discussed in the previous module may not help in preventing death. Breaking the bad news regarding the condition of the patient well in time may ease the handling of death related issues. Documentation of death in as much clear terms as possible is absolutely essential. Handling of the dead body adhering to the infection control recommendations is also very important. Cooperation from relatives and administration has to be ensured, depending on the situation. The IMG is expected to be well aware of the medical and social consequences of death during a pandemic. Beyond the skills that are necessary to perform these procedures, the IMG should also have the knowledge, attitude and communication skills to manage such a situation.

Competencies addressed

The student should be able to:	**Level**
Demonstrate the ability to handle death related events during outbreaks	SH

Case study

Mr. Abdul, 50 years old, has been admitted with a febrile illness, which he developed after staying with his son who recently came from a metropolitan city where an unknown disease had been declared. He was intubated and was on ventilator for two

days. He was being managed in an isolation room with all airborne precautions. He was showing signs of improvement when he suddenly became unconscious and stopped breathing. Cardio-pulmonary resuscitation was attempted but failed. He died about 15 minutes after he developed the symptoms in the ICU. The doctor declared that he is no more.

- How is the event discussed with the relatives?
- What documents are to be prepared regarding the event?
- What care has to be exercised to prevent the transmission of infection after death?
- How will you discuss the issues with the relatives?

Learning points

- The emotional issues for the relatives and HCWs related to death of a person during epidemics.
- The principles of documentation and reporting and legal and ethical issues of death during epidemics.
- The aspects related to infection control practices like prophylaxis (if any), disinfection etc.

Learning Experience

Year of study: Professional year Phase III Part 2

Hours: 2 hours

i. Interactive discussion – 1 hour
   a. Confirmation and documentation of death
   b. Steps to be taken to reduce transmission of infections
   c. Attitude and Communication Issues related to handling of dead bodies
   d. Responding to media

ii. Role Play for communication skills and documentation with debriefing and feedback - 1 hour

Assessment

1. **Formative:** Viva can be used. This could be done immediately after the module and/or later with internal assessment.
2. **Summative:** Viva, SAQ, MCQ

Module 4.4
Information Management during Pandemics

Description:

During the spread of any infection, the community reacts in a certain fashion. Initially there will be fear of spread, maligning the affected people, stigma and discrimination and panic. The media also plays with this and try to sensationalise the whole issue. Any variations from normal pattern of response and functioning of HCWs will be criticised and negative messages will be generated. The media, when well informed, can help a lot in public awareness, health education and behaviour change. It depends to a large extent in sharing the proper information with them at the right time. The sanctity of the media and the right of society to criticise must also be respected.

The social media gets flooded with messages related to outbreaks very early. Most of these messages are based on inadequate information and improper interpretation of the unscientific ideas. Unfortunately, most of the knowledge that is shared in the social media is neither verified nor controlled by anyone. At the same time the online social media is an effective tool for spreading the right messages.

In many epidemics, contact precautions are to be adopted by HCWs and the general public. The visit to the hospital could contribute significantly to spread of infections. In many infections, home or institutional quarantine may be in place. These persons may develop many illnesses and other problems that do not require a face to face consultation. In such instances, the authorities have opened up the avenue of Telemedicine as a viable alternative. History taking and to some extent visual examination of the patient can be done using common virtual platforms. More exploratory options are available using sophisticated instruments like electronic stethoscope, portable ultrasound etc. Counselling is another activity that can use this platform. Online prescriptions in standardised format is also being accepted now. The IMG should be aware of the clinical, emotional, social and legal issues associated with this form of medical practice. Familiarity with electronic medical records, referral

patterns, virtual documentation etc. is also desirable. The virtual platform is also useful for health education and formal teaching and training for students and HCWs.

Competencies addressed:

The student should be able to:	**Level**
Demonstrate the ability to prepare media reports, use online communication	SH
Demonstrate the ability to handle media communication and education	SH
Demonstrate the ability to recognise spam & fake messages	SH

Case study 1

Mrs. Rachel, 30 years old, has been admitted with a febrile illness, 4 days after attending a funeral attended by many persons from outside the country. She became sick and was intubated in the emergency room. There was some delay in transferring the patient to intensive care unit. Within a few minutes, a few cameramen from visual media reached the campus and started reporting alleged deficiencies in care. Messages with similar content also started appearing in the social media. It was argued that the delay was because a very fatal infection was suspected in the patient and HCWs were refusing to see the patient. It was also suggested that this disease is spreading fast, is lethal and no cure is available.

- As the Medical Officer on duty on that particular day, you are asked to comment on what went wrong?
- You have been requested by your friends to start a messaging series countering the text messages appearing in the social media. What steps are recommended?
- How will you create a proper message for the visual media and social messaging platform?
- How can you develop a Tele-consultation system in your practice?

Learning points

- The chance of even small variations in the working of hospitals getting media attention
- The irresponsible behaviour from many corners of the society
- The need to prevent fake messages and to spread correct information.
- The proper use of Telemedicine for clinical and academic work.

Learning Experience

Year of study: Professional year Phase III Part 2

Hours: 4 hours

i. Interactive discussion - 2 hours
   a. Responding to media
   b. Use and misuse of social media for health related messages.

ii. Visit to the media centre / Tele Medicine unit - 1 hour

iii. Role Plays for responding to media with Debriefing and Feedback - 1 hour

Assessment

1. **Formative:** Viva can be used. This could be done immediately after the module and/or later with internal assessment
2. **Summative:** Not needed

Module 4.5
Intensive Care Management during Pandemics

Description:

Pandemics become important, when there is a high degree of morbidity and associated mortality. This usually happens to persons at extremes of age. The elderly are highly vulnerable due to the aging process and compromised system functions and also because of many co-morbidities. Children and infants suffer mainly because of lack of immunity and higher chances of mingling and other issues like malnutrition. However, this pattern may get altered due to various reasons. The working population constituted by the young and middle aged can be affected in epidemics with direct links to the environment – ecological and employment related: e.g. Leptospirosis, Dengue, Chikungunya etc. Gender variations can also happen due to various predisposing factors among any gender groups. Serious involvement of organs systems like respiratory, cardiac, nervous or renal can lead to rapid deterioration in the patient's condition which may require extra care with lot of support and monitoring.

Intensive care is specialised care given in specialised settings with regular monitoring and corrective measures instituted without delay by a team of trained health care workers. The Intensive Care Unit (ICU) of today works with lots of gadgets and standard protocols. In addition to the technical details about diagnosis, prognostication and management, the team care concept and management of affective and communication issues related to ICU care also has to be imbibed by the learner. This form of care is usually very expensive and adds to the financial burden of the family as well. Maintenance of a good ICU demands the use of lots of technology, behaviour change, attitudinal modifications and team skills.

The routine intensive care that is offered for management of pandemic related cases also needs special training, as this involves high levels of integrity, dedication and commitment in terms of effort, compassion and a sense of urgency. This is also compounded by the fact that there are epidemiological issues as well.

This module intends to give the learner an insight into the intricacies of intensive care during the pandemics.

Competencies addressed:

The student should be able to:	**Level**
Visit, enumerate and describe the functions of an Intensive Care Unit	KH
Enumerate and describe the criteria for admission and discharge of a patient to an ICU	KH
Observe and describe the management of an unconscious patient	KH
Observe and describe the basic setup process of a ventilator	KH
Observe and describe the principles of monitoring in an ICU	KH

Case study

55 year old Krishnan, known case of systemic hypertension and type 2 diabetes mellitus presented with cough and breathing difficulty in the last 3 days. Patient was diagnosed with Covid-19 infection. Patient was referred to Covid isolation ICU in view of severe breathing difficulty, tachypnoea and desaturation. Patient was transported to ICU in oxygen trolley with O_2 via simple face mask considering all Covid-19 precautions.

Monitors were attached. On examination, patient conscious, oriented, tachypnoeic, Pulse Rate -120/min, BP-128/72mmHg, RR-32/min. ABG showed respiratory alkalosis with PaO2/FiO2 = 138(moderate ARDS). Initial CURB 60 score was 2. Patient was put on High Frequency Nasal Cannula (HFNC) with flow rate of 40L/min and FiO2 of 90%. Routine investigations were sent which includes CBC, ESR, RFT, LFT, serum electrolytes, coagulation profile, viral markers, blood grouping. Prognostic markers were done : CRP > 100 mg/L, LDH – 600 units/L, Trop I - <2.5 ng/L, D dimer – 1400 ng/ml, Serum ferritin – 565 ng/ml. Chest X-ray showed bilateral chest infiltrates. ECG showed normal sinus rhythm.

As the doctor on duty on that particular day, you are asked to plan future management.

Learning points

1. Initial assessment of patient in ICU
2. Early stabilisation of patient
3. Prognostication and management using standard protocols
4. Coordination with doctors and paramedical staff
5. Communication with the bystanders
6. Reporting to higher authorities

Learning Experience

Year of study: Professional year Phase III Part 2

Hours: 4 hours

i. Interactive Discussion – 1 hour
   a. Interactive Lecture with videos

ii. Visit to the ICU – 1 hour
   a. Infection control
   b. Monitoring of vital signs
   c. Interpreting investigations
   d. Monitoring using equipment

iii. Role Play – 1 hour

iv. Debriefing session by intensivist - 1 hour

Points for Discussion

INITIAL STABILISATION OF PATIENT IN ICU

When a patient is received in ICU,

1. Make sure that the below said equipments are available:
   a. Oxygen source
   b. Airway cart
   c. Working suction
   d. Monitors

e. Emergency drugs
f. Defibrillator

2. Attach monitors
3. The primary survey should follow A-B-C-D-E

A- Airway

- If the patient can speak, the airway is patent
- Airway patency not maintained, triple manoeuvre-head tilt, chin lift and jaw thrust.
- If still not maintained, use oropharyngeal/nasal airways.

B- Breathing

- Check for oxygen saturation and respiratory rate
- If SpO2<90% and RR>30---give oxygen supplementation via
    a) Nasal prongs
    b) Simple face mask
    c) Venturie face mask

C- Circulation

- SBP<90—check distal pulses, confirm IV access and give fluid bolus
- Start on inotropic support

D - Determine GCS and assess pupils

E- Examine the patient

4. **Inform superior officer**

Assessment

1. **Formative:** Pre-test – Post Test; Viva can be used. This could be done immediately after the module and/or later with internal assessment.
2. **Summative:** Case based short note with plan of management, MCQ

Module 4.6
Palliative Care during Pandemics

Description:

During pandemics and other periods, many patients are likely to develop long lasting consequences after acute illness. After intensive care, a stage may be reached, when patients do not require to be in major institutions or need regular therapeutic procedures. Such persons require long-term care with social support systems. They may require only supportive, curative and rehabilitative interventions. The care is also aimed at making life comfortable and pleasant for them in the future. The patient may or may not recover, but giving hope for a better tomorrow may help them cope with the illness.

Palliative care is a broad speciality with plenty of activities. This module aims to familiarise the learner with the concept of palliative care.

This module may also be used to discuss about the issues related to isolation and solitude by the patients and also about the unhealthy stigma and discrimination experienced by patients, relatives and colleagues. Points may be raised about the issues faced by Health Care Workers, their emotional issues, burn out etc. as well. Social issues related to restriction of activities may be also be discussed along with this module.

Competencies addressed:

The student should be able to:	**Level**
Demonstrate an understanding and needs and preferences of patients when choosing curative and palliative therapy.	KH

Case study

James, 38 year old salesman, developed a febrile illness He was tested positive for a new viral infection. He developed shock while on treatment. He was started on inotropic supports, catheterised, was shifted with O_2 via simple face mask.

In CCU, on day 2 patient developed fever, GCS was E3VTM4, oliguria. Investigations revealed increased total count, increase in CRP, thrombocytopenia, altered RFT. ABG showed high anion gap metabolic acidosis. Patient developed sepsis with Acute Kidney Injury and Renal Replacement Therapy was initiated. Post dialysis patient was on double inotropic (noradrenaline and vasopressin) supports.

Post op day 4, GCS was E2VTM3, anisocoria present, investigations revealed haemoglobin - 9g/dl, total count – 20,000, platelet count – 60,000, urea/creatinine – 90/3, potassium – 5.2, altered LFT and coagulopathy. CT brain was taken which showed large right tempero-parietal bleed with IVH and midline shift. Since the patient was in septic shock with multi-organ dysfunction and DIC, it was decided for conservative line of management. Intensivist decided to discuss about palliative care with the family.

“I am Dr. , I am the treating physician of your son. I am here to explain the health condition of your son. As you know your son now has multi-organ failure. He has widespread blood stream infection which has affected his multiple organs. His vitals are unstable and is on multiple inotropic supports. He developed a condition called DIC and as a result there is large bleeding in his brain. In this situation, surgery would offer no benefit. It might further worsen his condition. Now, his vitals are only maintained with so much medications and ventilatory support. Any therapy aiming to improve his clinical condition will be futile. We are anticipating a gradual clinical deterioration which might end up in his death. So, we would suggest a palliative comfort care for this patient with your consent.

Learning points

1. Need to assess a patient well before palliative care is suggested
2. Importance of planning palliative care

3. Communicating to the patients and relatives about the need and utility of planned palliative care

Learning Experience

Year of study: Professional year Phase III Part 2

Hours: 4 hours

i. Interactive discussion – 1 hour
   a. Interactive Lecture with videos

ii. Visit to the palliative care unit – 1 hour
   a. Pain & palliation
   b. Educational activities regarding continuation of care and warning signs
   c. Monitoring using basic observations and examinations
   d. Nutritional care
   e. Emotional care

iii. Role Play – 1 hours

iv. Debriefing session by intensivist - 1 hour

Assessment

1. **Formative:** Pre-test – Post Test; Viva can be used. This could be done immediately after the module and/or later with internal assessment
2. **Summative:** Case based short note on palliative care, MCQ

Module 4.7
Mental health issues during Pandemics

Description:

The pandemic, besides affecting the physical health, has a potential of immense mental health effects, both during and after its occurrence. The mental health repercussions are on an affected individual and in the general community. There is an apprehension of contracting the disease, the uncertainty of procuring medical help and the unpredictable nature of the disease, which causes fear and anxiety in the people. Social isolation or social distancing impacts wellbeing; work from home and home schooling are new and alien dimensions to life. There are worries about the real-world consequences of the pandemic, such as financial struggles.

The loneliness of quarantine, death and long-term consequences affecting oneself and the family are causes for perturbation in patients. Stigma and guilt for spreading the disease are two burdens carried by most patients. There is an increase in anxiety, depression, stress, post-traumatic stress disorder and the possibility of risk of suicide. Besides these direct and indirect psychosocial effects, the virus directly or through an immune reaction affects the brain and leads to mental health and neurological manifestations. In the aftermath of the disease, long term complications can precipitate mental illness.

Some groups of people are more prone to mental health impact. The vulnerable population are frontline workers, elders, children and adolescent, people suffering from mental illnesses and disabilities, women, migrant workers and individuals in conflict situations.

Competencies addressed:

The student should be able to:	Level
Describe and discuss the mental health consequences of an epidemic on the general population, patients and health care workers	K
Demonstrate the ability to look after one's mental health during a stressful time of a pandemic	KH
Demonstrate the role of IMG in identification and referral of significant mental illness in response to the pandemic	SH
Demonstrate the ability to counsel patients with minor stress related symptoms in response to the pandemic	SH

Case study

Mr. P. businessman aged 62 years, admitted in a single room of a Covid-19 hospital with mild respiratory symptoms. He could not sleep for two nights. During ward rounds, he expresses worry about the future of his business in case something happens to him. His wife and son were admitted to another isolation hospital, and he was unable to communicate with them and suffers from palpitations and tremors when he thinks about them. You are approached by relatives, who request you to assess him for suicidal ideas.

How will you manage the situation?

Learning points

The student should be able to recognize:

1. The psychological impact of a novel disease and about which there is little known, and many uncertainties exist.

2. Issues related to quarantine or lockdown such as social distancing, isolation, stigma, loss of contacts.
3. Patient's concerns about availability and cost of treatment, economic issues, probable death and its impact.
4. Signs and symptoms of anxiety, panic and depression and its management.
5. Signs of suicidal ideation and the need for referral of patients if needed.
6. The ability to counsel patients for minor stress related symptoms.

Learning Experience

Year of study: Professional year Phase III Part 2

Hours: 04

v. Interactive Lecture with videos – 1 hour
vi. Group discussion with frontline staff and telephonic conversations with recovered patients and their family members (live or recorded) - 1 hour
vii. Role plays – 1 hour
viii. Debriefing session by a physician, psychiatrist and nurse - 1 hour

Discussion points

Different issues are faced by people belonging to the following categories:

a. Older people who are dependent on others for daily activities and who are technologically handicapped,
b. People with co-morbidities that worsen with any co-existing illness, e.g. Chronic Kidney Disease, Chronic Lung, Liver and heart diseases,
c. Worsening of disorders in persons with pre-existing mental health problems,
d. People with disabilities,
e. Persons who do not stay with their relatives, e.g. at nursing homes, homeless people,
f. Ethnic minorities, persons staying in far off places,
g. Illiterate persons, persons who cannot use electronic media,
h. Healthy persons who are caring for the above types of patients at home.

There are other relevant issues like:

i. **Knowing when a psychiatry referral is required.** Being aware of where the nearest help is available,
ii. **Knowledge and skills required for supportive counselling.** Counselling involves forming an empathetic, warm and genuine relationship, demonstrating non-judgmental, active listening and giving positive feedback and reassurance. It involves encouraging the person to find simple solutions to their problems,
iii. **Burden and mental health of caretakers.** Health care workers are at risk for mental health issues which can be prevented and treated. Self-care and the need for professional advice as and when required is important. Periodic relaxation with duty breaks may be helpful.

The emotional issues may take the form of anxiety as expressed by persistent and excessive worry, irritability and sleep problems. Panic attacks may present as sudden onset of anxiety with trembling, paresthesia, palpitations, shortness of breath, choking sensation, chest pain, nausea, vomiting, dizziness, sweating and a sense of impending doom.

It is necessary to observe for signs of depression. These include sadness of mood, helplessness, hopelessness, loss of worth, decreased interactions, loss of appetite, loss of sleep, and recurrent thoughts about death or suicide. There may be references to bereaved persons, guilt, self-hatred, and self-harm. Unless taken care of promptly, these may lead to suicidal ideation/ attempts.

Stress may have varying presentations and may include:

- **physical symptoms:** headaches, sleeping and eating difficulties,
- **behavioural symptoms:** low motivation to work, starting or increasing use of alcohol or drugs, decreased interaction,
- **emotional symptoms:** fear, anxiety, sadness and anger.

A psychiatry referral is required if symptoms are pervasive, distressing and cause impairment. The presence of persistent suicidal ideas is another important reason for a consult. Patients who do not improve with brief counselling interventions would benefit from interventions by a psychiatrist.

Interventions suggested are:

a. Be informed and do not fall prey to rumours and social media infodemic.
b. Have a routine regarding sleep and meals. Allocate time for work, rest and exercise. Set up priorities and follow a daily pattern of activities. Revive hobbies.
c. Be in contact with your social circle. Regular conversations and communications at a personal level with the use of phones or digital media (video conferencing) is important.
d. Restriction of screen time is suggested.
e. Engage oneself in stimulating and motivational activities.
f. Connect with nature, life, people around and with those who have recovered.
g. Look after oneself through nutritious food, exercises, motivating and positive thoughts and practice spirituality.
h. Use relaxation and breathing exercises to help in anxiety and sleep.
i. Seek help from phone counselling and self-help groups.
j. Refer to psychiatrist, if required for telemedicine consults.

Assessment

1. **Formative:** DOPS, Viva can be used. This could be done immediately after the module and/or later with internal assessment.

2. **Summative:** not required.

Further reading:

WHO. Mental health and psychosocial considerations during the COVID-19 outbreak-Interim guidance WHO/2019-nCoV/MentalHealth/2020.1 available at https://www.who.int/publications/i/item/WHO-2019-nCoV-MentalHealth-2020.1

The copy of THE EPIDEMIC DISEASES ACT, 1897 & THE DISASTER MANAGEMENT ACT, 2005 which have been attached as Annexure I and Annexure II respectively, have been obtained from India Code Depository of All Central and States Acts Website.

Link:- https://www.indiacode.nic.in/

Annexure I

THE EPIDEMIC DISEASES ACT, 1897

&

Annexure II

THE DISASTER MANAGEMENT ACT, 2005

THE EPIDEMIC DISEASES ACT, 1897

ARRANGEMENT OF SECTIONS

SECTIONS

1. Short title and extent.
2. Power to take special measures and prescribe regulations as to dangerous epidemic disease.

2A. Powers of Central Government.

3. Penalty.
4. Protection to persons acting under Act.

THE EPIDEMIC DISEASES ACT, 1897

ACT NO. 3 OF 1897[1]

[4*th February*, 1897.]

An Act to provide for the better prevention of the spread of Dangerous Epidemic Diseases.

WHEREAS it is expedient to provide for the better prevention of the spread of dangerous epidemic disease; It is hereby enacted as follows :—

1. Short title and extent.—(*1*) This Act may be called the Epidemic Diseases Act, 1897.

[2][(*2*) It extends to the whole of India except [3][the territories which, immediately before the 1st November, 1956, were comprised in Part B States]] [4]* * *

[5]* * * * *

[6]**2. Power to take special measures and prescribe regulations as to dangerous epidemic disease.**—(*1*) When at any time the [7][State Government] is satisfied that [7][the State] or any part thereof is visited by, or threatened with, an outbreak of any dangerous epidemic disease, the [8][State Government], if [9][it] thinks that the ordinary provisions of the law for the time being in force are insufficient for the purpose, may take, or require or empower any person to take, such measures and, by public notice, prescribe such temporary regulations to be observed by the public or by any person or class of persons as [9][it] shall deem necessary to prevent the outbreak of such disease or the spread thereof, and may determine in what manner and by whom any expenses incurred (including compensation if any) shall be defrayed.

(*2*) In particular and without prejudice to the generality of the foregoing provisions, the [7][State Government] may take measures and prescribe regulations for—

[10]* * * * *

(*b*) the inspection of persons travelling by railway or otherwise, and the segregation, in hospital, temporary accommodation or otherwise, of persons suspected by the inspecting officer of being infected with any such disease.

[11]* * * * *

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1. This Act has been amended in its application to—
   (*1*) the Punjab by the Epidemic Diseases (Punjab Amendment) Act, 1944 (Punjab Act 3 of 1944); in East Punjab by East Punjab Act 1 of 1947:
   (*2*) the C. P. and Berar by the C. P. and Berar Epidemic Diseases (Amendment) Act, 1945 (C. P. and Berar Act 4 of 1945).
   The Act has been extended to—
   (*1*) the whole of Madhya Pradesh by M.P. Act 23 of 1958 (when notified).
   (*2*) the transferred territories of Punjab by Punjab Act 8 of 1961.
   (*3*) in Dadra and Nagar Haveli (w.e.f. 1-7-1965) by Reg. 6 of 1963, s. 2 and Sch.
   (*4*) to Lakshadweep (w.e.f. 1-10-1967) : *vide* Reg. 8 of 1965, s. 3 and Sch.
   (*5*) Union territory of Pondicherry by Act 26 of 1968, s. 3 and Sch.
   The Act has been repealed in its application to Bellary District by Mysore Act 14 of 1955.
2. Subs. by the A.O. 1950.
3. Subs. by the Adaptation of Laws (No. 2) Order, 1956 for "Part B States".
4. The word "and" rep. by Act 10 of 1914, s. 3 and the Second Schedule.
5. Sub-section (*3*) rep. by s. 3 and the Second Schedule, *ibid*.
6. For Notifications issued under this section, *see* different local Rules and Orders.
7. Subs. by the A.O. 1937, for "G.G. in C."
8. Subs., *ibid.*, for "India".
9. Subs., *ibid.*, for "he".
10. Paragraph (*a*) omitted, *ibid.*
11. Sub-section (*3*) omitted by Act 38 of 1920, s. 2 and the First Schedule.

[1][**2A. Powers of Central Government.**—When the Central Government is satisfied that India or any part thereof is visited by, or threatened with, an outbreak of any dangerous epidemic disease and that the ordinary provisions of the law for the time being in force are insufficient to prevent the outbreak of such disease or the spread thereof, the Central Government may take measures and prescribe regulations for the inspection of any ship or vessel leaving or arriving at any port in [2][the territories to which this Act extends] and for such detention thereof, or of any person intending to sail therein, or arriving thereby, as may be necessary.]

3. Penalty.—Any person disobeying any regulation or order made under this Act shall be deemed to have committed an offence punishable under section 188 of the Indian Penal Code (45 of 1860).

4. Protection to persons acting under Act.—No suit or other legal proceeding shall lie against any person for anything done or in good faith intended to be done under this Act.

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1. Ins. by Act 38 of 1920, s. 2 and the First Schedule. Earlier substituted by the A.O.1937.
2. Subs. by the Adaptation of Laws (No.2) Order, 1956, for "a Part A State or a Part C State".

THE DISASTER MANAGEMENT ACT, 2005

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THE DISASTER MANAGEMENT ACT, 2005

ACT NO. 53 OF 2005

[23*rd December*, 2005.]

An Act to provide for the effective management of disasters and for matters connected therewith or incidental thereto.

BE it enacted by Parliament in the Fifty-sixth Year of the Republic of India as follows:—

CHAPTER I

PRELIMINARY

1. Short title, extent and commencement.—(*1*) This Act may be called the Disaster Management Act, 2005.

(*2*) It extends to the whole of India.

(*3*) It shall come into force on such date[1] as the Central Government may, by notification in the Official Gazette appoint; and different dates* may be appointed for different provisions of this Act and for different States, and any reference to commencement in any provision of this Act in relation to any State shall be construed as a reference to the commencement of that provision in that State.

2. Definitions.—In this Act, unless the context otherwise requires,—

(*a*) "affected area" means an area or part of the country affected by a disaster;

(*b*) "capacity-building" includes—

(*i*) identification of existing resources and resources to be acquired or created;

(*ii*) acquiring or creating resources identified under sub-clause (*i*);

(*iii*) organisation and training of personnel and coordination of such training for effective management of disasters;

(*c*) "Central Government" means the Ministry or Department of the Government of India having administrative control of disaster management;

(*d*) "disaster" means a catastrophe, mishap, calamity or grave occurrence in any area, arising from natural or man made causes, or by accident or negligence which results in substantial loss of life or human suffering or damage to, and destruction of, property, or damage to, or degradation of, environment, and is of such a nature or magnitude as to be beyond the coping capacity of the community of the affected area;

(*e*) "disaster management" means a continuous and integrated process of planning, organising, coordinating and implementing measures which are necessary or expedient for—

(*i*) prevention of danger or threat of any disaster;

(*ii*) mitigation or reduction of risk of any disaster or its severity or consequences;

(*iii*) capacity-building;

(*iv*) preparedness to deal with any disaster;

(*v*) prompt response to any threatening disaster situation or disaster;

(*vi*) assessing the severity or magnitude of effects of any disaster;

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1. 28th July, 2006 (ss. 2, 3, 4, 5, 6, 8, 10, 75, 77, 79), *vide* notification No. S.O. 1216(E), dated 28th July, 2006;

*1st August, 2007 [ss. 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 38, 39, 40, 41, 48, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, sub-sec. (2) of s. 70, 71, 72, 73, 74, 78, 79], *vide* notification No. S.O. 722(E), dated 7th May, 2007;

*17th March, 2008 (ss. 44, 45), *vide* notification No. 517(E), dated 17th March, 2008;

*18th October, 2011 (s. 46), *vide* notification No. S.O. 2397(E), dated 18th October, 2011, *see* Gazette of India, Extraordinary, Part II, sec. 3(*ii*).

(*vii*) evacuation, rescue and relief;

(*viii*) rehabilitation and reconstruction;

(*f*) "District Authority" means the District Disaster Management Authority constituted under sub-section (*1*) of section 25;

(*g*) "District Plan" means the plan for disaster management for the district prepared under section 31;

(*h*) "local authority" includes panchayati raj institutions, municipalities, a district board, cantonment board, town planning authority or Zila Parishad or any other body or authority, by whatever name called, for the time being invested by law, for rendering essential services or, with the control and management of civic services, within a specified local area;

(*i*) "mitigation" means measures aimed at reducing the risk, impact or effects of a disaster or threatening disaster situation;

(*j*) "National Authority" means the National Disaster Management Authority established under sub-section (*1*) of section 3;

(*k*) "National Executive Committee" means the Executive Committee of the National Authority constituted under sub-section (*1*) of section 8;

(*l*) "National Plan" means the plan for disaster management for the whole of the country prepared under section 11;

(*m*) "preparedness" means the state of readiness to deal with a threatening disaster situation or disaster and the effects thereof;

(*n*) "prescribed" means prescribed by rules made under this Act;

(*o*) "reconstruction" means construction or restoration of any property after a disaster;

(*p*) "resources" includes manpower, services, materials and provisions;

(*q*) "State Authority" means the State Disaster Management Authority established under sub-section (*1*) of section 14 and includes the Disaster Management Authority for the Union territory constituted under that section;

(*r*) "State Executive Committee" means the Executive Committee of a State Authority constituted under sub-section (*1*) of section 20;

(*s*) "State Government" means the Department of Government of the State having administrative control of disaster management and includes Administrator of the Union territory appointed by the President under article 239 of the Constitution;

(*t*) "State Plan" means the plan for disaster management for the whole of the State prepared under section 23.

CHAPTER II

THE NATIONAL DISASTER MANAGEMENT AUTHORITY

3. Establishment of National Disaster Management Authority.—(*1*) With effect from such date as the Central Government may, by notification in the Official Gazette appoint in this behalf, there shall be established for the purposes of this Act, an authority to be known as the National Disaster Management Authority.

(*2*) The National Authority shall consist of the Chairperson and such number of other members, not exceeding nine, as may be prescribed by the Central Government and, unless the rules otherwise provide, the National Authority shall consist of the following:—

(*a*) the Prime Minister of India, who shall be the Chairperson of the National Authority, *ex officio;*

(*b*) other members, not exceeding nine, to be nominated by the Chairperson of the National Authority.

(*3*) The Chairperson of the National Authority may designate one of the members nominated under clause (*b*) of sub-section (*2*) to be the Vice-Chairperson of the National Authority.

(*4*) The term of office and conditions of service of members of the National Authority shall be such as may be prescribed.

4. Meetings of National Authority.—(*1*) The National Authority shall meet as and when necessary and at such time and place as the Chairperson of the National Authority may think fit.

(*2*) The Chairperson of the National Authority shall preside over the meetings of the National Authority.

(*3*) If for any reason the Chairperson of the National Authority is unable to attend any meeting of the National Authority, the Vice-Chairperson of the National Authority shall preside over the meeting.

5. Appointment of officers and other employees of the National Authority.—The Central Government shall provide the National Authority with such officers, consultants and employees, as it considers necessary for carrying out the functions of the National Authority.

6. Powers and functions of National Authority.—(*1*) Subject to the provisions of this Act, the National Authority shall have the responsibility for laying down the policies, plans and guidelines for disaster management for ensuring timely and effective response to disaster.

(*2*) Without prejudice to generality of the provisions contained in sub-section (*1*), the National Authority may —

(*a*) lay down policies on disaster management;

(*b*) approve the National Plan;

(*c*) approve plans prepared by the Ministries or Departments of the Government of India in accordance with the National Plan;

(*d*) lay down guidelines to be followed by the State Authorities in drawing up the State Plan;

(*e*) lay down guidelines to be followed by the different Ministries or Departments of the Government of India for the purpose of integrating the measures for prevention of disaster or the mitigation of its effects in their development plans and projects;

(*f*) coordinate the enforcement and implementation of the policy and plan for disaster management;

(*g*) recommend provision of funds for the purpose of mitigation;

(*h*) provide such support to other countries affected by major disasters as may be determined by the Central Government;

(*i*) take such other measures for the prevention of disaster, or the mitigation, or preparedness and capacity building for dealing with the threatening disaster situation or disaster as it may consider necessary;

(*j*) lay down broad policies and guidelines for the functioning of the National Institute of Disaster Management.

(*3*) The Chairperson of the National Authority shall, in the case of emergency, have power to exercise all or any of the powers of the National Authority but exercise of such powers shall be subject to *ex post facto* ratification by the National Authority.

7. Constitution of advisory committee by National Authority.—(*1*) The National Authority may constitute an advisory committee consisting of experts in the field of disaster management and having practical experience of disaster management at the national, State or district level to make recommendations on different aspects of disaster management.

(*2*) The members of the advisory committee shall be paid such allowances as may be prescribed by the Central Government in consultation with the National Authority.

8. Constitution of National Executive Committee.—(*1*) The Central Government shall, immediately after issue of notification under sub-section (*1*) of section 3, constitute a National Executive Committee to assist the National Authority in the performance of its functions under this Act.

(*2*) The National Executive Committee shall consist of the following members, namely:—

(*a*) the Secretary to the Government of India in charge of the Ministry or Department of the Central Government having administrative control of the disaster management, who shall be Chairperson, *ex officio;*

(*b*) the Secretaries to the Government of India in the Ministries or Departments having administrative control of the agriculture, atomic energy, defence, drinking water supply, environment and forests, finance (expenditure), health, power, rural development, science and technology, space, telecommunication, urban development, water resources and the Chief of the Integrated Defence Staff of the Chiefs of Staff Committee, *ex officio*.

(*3*) The Chairperson of the National Executive Committee may invite any other officer of the Central Government or a State Government for taking part in any meeting of the National Executive Committee and shall exercise such powers and perform such functions as may be prescribed by the Central Government in consultation with the National Authority.

(*4*) The procedure to be followed by the National Executive Committee in exercise of its powers and discharge of its functions shall be such as may be prescribed by the Central Government.

9. Constitution of sub-committees.—(*1*) The National Executive Committee may, as and when it considers necessary, constitute one or more sub-committees, for the efficient discharge of its functions.

(*2*) The National Executive Committee shall, from amongst its members, appoint the Chairperson of the sub-committee referred to in sub-section (*1*).

(*3*) Any person associated as an expert with any sub-committee may be paid such allowances as may be prescribed by the Central Government.

10. Powers and functions of National Executive Committee.—(*1*) The National Executive Committee shall assist the National Authority in the discharge of its functions and have the responsibility for implementing the policies and plans of the National Authority and ensure the compliance of directions issued by the Central Government for the purpose of disaster management in the country.

(*2*) Without prejudice to the generality of the provisions contained in sub-section (*1*), the National Executive Committee may—

(*a*) act as the coordinating and monitoring body for disaster management;

(*b*) prepare the National Plan to be approved by the National Authority;

(*c*) coordinate and monitor the implementation of the National Policy;

(*d*) lay down guidelines for preparing disaster management plans by different Ministries or Departments of the Government of India and the State Authorities;

(*e*) provide necessary technical assistance to the State Governments and the State Authorities for preparing their disaster management plans in accordance with the guidelines laid down by the National Authority;

(*f*) monitor the implementation of the National Plan and the plans prepared by the Ministries or Departments of the Government of India;

(*g*) monitor the implementation of the guidelines laid down by the National Authority for integrating of measures for prevention of disasters and mitigation by the Ministries or Departments in their development plans and projects;

(*h*) monitor, coordinate and give directions regarding the mitigation and preparedness measures to be taken by different Ministries or Departments and agencies of the Government;

(*i*) evaluate the preparedness at all governmental levels for the purpose of responding to any threatening disaster situation or disaster and give directions, where necessary, for enhancing such preparedness;

(*j*) plan and coordinate specialised training programme for disaster management for different levels of officers, employees and voluntary rescue workers;

(*k*) coordinate response in the event of any threatening disaster situation or disaster;

(*l*) lay down guidelines for, or give directions to, the concerned Ministries or Departments of the Government of India, the State Governments and the State Authorities regarding measures to be taken by them in response to any threatening disaster situation or disaster;

(*m*) require any department or agency of the Government to make available to the National Authority or State Authorities such men or material resources as are available with it for the purposes of emergency response, rescue and relief;

(*n*) advise, assist and coordinate the activities of the Ministries or Departments of the Government of India, State Authorities, statutory bodies, other governmental or non-governmental organisations and others engaged in disaster management;

(*o*) provide necessary technical assistance or give advice to the State Authorities and District Authorities for carrying out their functions under this Act;

(*p*) promote general education and awareness in relation to disaster management; and

(*q*) perform such other functions as the National Authority may require it to perform.

11. National Plan.—(*1*) There shall be drawn up a plan for disaster management for the whole of the country to be called the National Plan.

(*2*) The National Plan shall be prepared by the National Executive Committee having regard to the National Policy and in consultation with the State Governments and expert bodies or organisations in the field of disaster management to be approved by the National Authority.

(*3*) The National Plan shall include—

(*a*) measures to be taken for the prevention of disasters, or the mitigation of their effects;

(*b*) measures to be taken for the integration of mitigation measures in the development plans;

(*c*) measures to be taken for preparedness and capacity building to effectively respond to any threatening disaster situations or disaster;

(*d*) roles and responsibilities of different Ministries or Departments of the Government of India in respect of measures specified in clauses (*a*), (*b*) and (*c*).

(*4*) The National Plan shall be reviewed and updated annually.

(*5*) Appropriate provisions shall be made by the Central Government for financing the measures to be carried out under the National Plan.

(*6*) Copies of the National Plan referred to in sub-sections (*2*) and (*4*) shall be made available to the Ministries or Departments of the Government of India and such Ministries or Departments shall draw up their own plans in accordance with the National Plan.

12. Guidelines for minimum standards of relief.—The National Authority shall recommend guidelines for the minimum standards of relief to be provided to persons affected by disaster, which shall include,—

(*i*) the minimum requirements to be provided in the relief camps in relation to shelter, food, drinking water, medical cover and sanitation;

(*ii*) the special provisions to be made for widows and orphans;

(*iii*) *ex gratia* assistance on account of loss of life as also assistance on account of damage to houses and for restoration of means of livelihood;

(*iv*) such other relief as may be necessary.

13. Relief in loan repayment, etc.—The National Authority may, in cases of disasters of severe magnitude, recommend relief in repayment of loans or for grant of fresh loans to the persons affected by disaster on such concessional terms as may be appropriate.

CHAPTER III

STATE DISASTER MANAGEMENT AUTHORITIES

14. Establishment of State Disaster Management Authority.—(*1*) Every State Government shall, as soon as may be after the issue of the notification under sub-section (*1*) of section 3, by notification in the Official Gazette, establish a State Disaster Management Authority for the State with such name as may be specified in the notification of the State Government.

(*2*) A State Authority shall consist of the Chairperson and such number of other members, not exceeding nine, as may be prescribed by the State Government and, unless the rules otherwise provide, the State Authority shall consist of the following members, namely:—

(*a*) the Chief Minister of the State, who shall be Chairperson, *ex officio*;

(*b*) other members, not exceeding eight, to be nominated by the Chairperson of the State Authority;

(*c*) the Chairperson of the State Executive Committee, *ex officio*.

(*3*) The Chairperson of the State Authority may designate one of the members nominated under clause (*b*) of sub-section (*2*) to be the Vice-Chairperson of the State Authority.

(*4*) The Chairperson of the State Executive Committee shall be the Chief Executive Officer of the State Authority, *ex officio*:

Provided that in the case of a Union territory having Legislative Assembly, except the Union territory of Delhi, the Chief Minister shall be the Chairperson of the Authority established under this section and in case of other Union territories, the Lieutenant Governor or the Administrator shall be the Chairperson of that Authority:

Provided further that the Lieutenant Governor of the Union territory of Delhi shall be the Chairperson and the Chief Minister thereof shall be the Vice-Chairperson of the State Authority.

(*5*) The term of office and conditions of service of members of the State Authority shall be such as may be prescribed.

15. Meetings of the State Authority.—(*1*) The State Authority shall meet as and when necessary and at such time and place as the Chairperson of the State Authority may think fit.

(*2*) The Chairperson of the State Authority shall preside over the meetings of the State Authority.

(*3*) If for any reason, the Chairperson of the State Authority is unable to attend the meeting of the State Authority, the Vice-Chairperson of the State Authority shall preside at the meeting.

16. Appointment of officers and other employees of State Authority.—The State Government shall provide the State Authority with such officers, consultants and employees, as it considers necessary, for carrying out the functions of the State Authority.

17. Constitution of advisory committee by the State Authority.—(*1*) A State Authority may, as and when it considers necessary, constitute an advisory committee, consisting of experts in the field of disaster management and having practical experience of disaster management to make recommendations on different aspects of disaster management.

(*2*) The members of the advisory committee shall be paid such allowances as may be prescribed by the State Government.

18. Powers and functions of State Authority.—(*1*) Subject to the provisions of this Act, a State Authority shall have the responsibility for laying down policies and plans for disaster management in the State.

(*2*) Without prejudice to the generality of provisions contained in sub-section (*1*), the State Authority may—

(*a*) lay down the State disaster management policy;

(*b*) approve the State Plan in accordance with the guidelines laid down by the National Authority;

(*c*) approve the disaster management plans prepared by the departments of the Government of the State;

(*d*) lay down guidelines to be followed by the departments of the Government of the State for the purposes of integration of measures for prevention of disasters and mitigation in their development plans and projects and provide necessary technical assistance therefor;

(*e*) coordinate the implementation of the State Plan;

(*f*) recommend provision of funds for mitigation and preparedness measures;

(*g*) review the development plans of the different departments of the State and ensure that prevention and mitigation measures are integrated therein;

(*h*) review the measures being taken for mitigation, capacity building and preparedness by the departments of the Government of the State and issue such guidelines as may be necessary.

(*3*) The Chairperson of the State Authority shall, in the case of emergency, have power to exercise all or any of the powers of the State Authority but the exercise of such powers shall be subject to *ex post facto* ratification of the State Authority.

19. Guidelines for minimum standard of relief by State Authority.—The State Authority shall lay down detailed guidelines for providing standards of relief to persons affected by disaster in the State:

Provided that such standards shall in no case be less than the minimum standards in the guidelines laid down by the National Authority in this regard.

20. Constitution of State Executive Committee.—(*1*) The State Government shall, immediately after issue of notification under sub-section (*1*) of section 14, constitute a State Executive Committee to assist the State Authority in the performance of its functions and to coordinate action in accordance with the guidelines laid down by the State Authority and ensure the compliance of directions issued by the State Government under this Act.

(*2*) The State Executive Committee shall consist of the following members, namely:—

(*a*) the Chief Secretary to the State Government, who shall be Chairperson, *ex officio*;

(*b*) four Secretaries to the Government of the State of such departments as the State Government may think fit, *ex officio*.

(*3*) The Chairperson of the State Executive Committee shall exercise such powers and perform such functions as may be prescribed by the State Government and such other powers and functions as may be delegated to him by the State Authority.

(*4*) The procedure to be followed by the State Executive Committee in exercise of its powers and discharge of its functions shall be such as may be prescribed by the State Government.

21. Constitution of sub-committees by State Executive Committee.—(*1*) The State Executive Committee may, as and when it considers necessary, constitute one or more sub-committees, for efficient discharge of its functions.

(*2*) The State Executive Committee shall, from amongst its members, appoint the Chairperson of the sub-committee referred to in sub-section (*1*).

(*3*) Any person associated as an expert with any sub-committee may be paid such allowances as may be prescribed by the State Government.

22. Functions of the State Executive Committee.—(*1*) The State Executive Committee shall have the responsibility for implementing the National Plan and State Plan and act as the coordinating and monitoring body for management of disaster in the State.

(*2*) Without prejudice to the generality of the provisions of sub-section (*1*), the State Executive Committee may—

(*a*) coordinate and monitor the implementation of the National Policy, the National Plan and the State Plan;

(*b*) examine the vulnerability of different parts of the State to different forms of disasters and specify measures to be taken for their prevention or mitigation;

(*c*) lay down guidelines for preparation of disaster management plans by the departments of the Government of the State and the District Authorities;

(*d*) monitor the implementation of disaster management plans prepared by the departments of the Government of the State and District Authorities;

(*e*) monitor the implementation of the guidelines laid down by the State Authority for integrating of measures for prevention of disasters and mitigation by the departments in their development plans and projects;

(*f*) evaluate preparedness at all governmental or non-governmental levels to respond to any threatening disaster situation or disaster and give directions, where necessary, for enhancing such preparedness;

(*g*) coordinate response in the event of any threatening disaster situation or disaster;

(*h*) give directions to any Department of the Government of the State or any other authority or body in the State regarding actions to be taken in response to any threatening disaster situation or disaster;

(*i*) promote general education, awareness and community training in regard to the forms of disasters to which different parts of the State are vulnerable and the measures that may be taken by such community to prevent the disaster, mitigate and respond to such disaster;

(*j*) advise, assist and coordinate the activities of the Departments of the Government of the State, District Authorities, statutory bodies and other governmental and non-governmental organisations engaged in disaster management;

(*k*) provide necessary technical assistance or give advice to District Authorities and local authorities for carrying out their functions effectively;

(*l*) advise the State Government regarding all financial matters in relation to disaster management;

(*m*) examine the construction, in any local area in the State and, if it is of the opinion that the standards laid for such construction for the prevention of disaster is not being or has not been followed, may direct the District Authority or the local authority, as the case may be, to take such action as may be necessary to secure compliance of such standards;

(*n*) provide information to the National Authority relating to different aspects of disaster management;

(*o*) lay down, review and update State level response plans and guidelines and ensure that the district level plans are prepared, reviewed and updated;

(*p*) ensure that communication systems are in order and the disaster management drills are carried out periodically;

(*q*) perform such other functions as may be assigned to it by the State Authority or as it may consider necessary.

23. State Plan.—(*1*) There shall be a plan for disaster management for every State to be called the State Disaster Management Plan.

(*2*) The State Plan shall be prepared by the State Executive Committee having regard to the guidelines laid down by the National Authority and after such consultation with local authorities, district authorities and the people's representatives as the State Executive Committee may deem fit.

(*3*) The State Plan prepared by the State Executive Committee under sub-section (*2*) shall be approved by the State Authority.

(*4*) The State Plan shall include,—

(*a*) the vulnerability of different parts of the State to different forms of disasters;

(*b*) the measures to be adopted for prevention and mitigation of disasters;

(*c*) the manner in which the mitigation measures shall be integrated with the development plans and projects;

(*d*) the capacity-building and preparedness measures to be taken;

(*e*) the roles and responsibilities of each Department of the Government of the State in relation to the measures specified in clauses (*b*), (*c*) and (*d*) above;

(*f*) the roles and responsibilities of different Departments of the Government of the State in responding to any threatening disaster situation or disaster.

(*5*) The State Plan shall be reviewed and updated annually.

(*6*) Appropriate provisions shall be made by the State Government for financing for the measures to be carried out under the State Plan.

(*7*) Copies of the State Plan referred to in sub-sections (*2*) and (*5*) shall be made available to the Departments of the Government of the State and such Departments shall draw up their own plans in accordance with the State Plan.

24. Powers and functions of State Executive Committee in the event of threatening disaster situation.—For the purpose of, assisting and protecting the community affected by disaster or providing relief to such community or, preventing or combating disruption or dealing with the effects of any threatening disaster situation, the State Executive Committee may—

(*a*) control and restrict, vehicular traffic to, from or within, the vulnerable or affected area;

(*b*) control and restrict the entry of any person into, his movement within and departure from, a vulnerable or affected area;

(*c*) remove debris, conduct search and carry out rescue operations;

(*d*) provide shelter, food, drinking water, essential provisions, healthcare and services in accordance with the standards laid down by the National Authority and State Authority;

(*e*) give direction to the concerned Department of the Government of the State, any District Authority or other authority, within the local limits of the State to take such measure or steps for rescue, evacuation or providing immediate relief saving lives or property, as may be necessary in its opinion;

(*f*) require any department of the Government of the State or any other body or authority or person in charge of any relevant resources to make available the resources for the purposes of emergency response, rescue and relief;

(*g*) require experts and consultants in the field of disasters to provide advice and assistance for rescue and relief;

(*h*) procure exclusive or preferential use of amenities from any authority or person as and when required;

(*i*) construct temporary bridges or other necessary structures and demolish unsafe structures which may be hazardous to public;

(*j*) ensure that non-governmental organisations carry out their activities in an equitable and non-discriminatory manner;

(*k*) disseminate information to public to deal with any threatening disaster situation or disaster;

(*l*) take such steps as the Central Government or the State Government may direct in this regard or take such other steps as are required or warranted by the form of any threatening disaster situation or disaster.

CHAPTER IV

DISTRICT DISASTER MANAGEMENT AUTHORITY

25. Constitution of District Disaster Management Authority.—(*1*) Every State Government shall, as soon as may be after issue of notification under sub-section (*1*) of section 14, by notification in the Official Gazette, establish a District Disaster Management Authority for every district in the State with such name as may be specified in that notification.

(*2*) The District Authority shall consist of the Chairperson and such number of other members, not exceeding seven, as may be prescribed by the State Government, and unless the rules otherwise provide, it shall consist of the following, namely:—

(*a*) the Collector or District Magistrate or Deputy Commissioner, as the case may be, of the district who shall be Chairperson, *ex officio*;

(*b*) the elected representative of the local authority who shall be the co-Chairperson, *ex officio*:

Provided that in the Tribal Areas, as referred to in the Sixth Schedule to the Constitution, the Chief Executive Member of the district council of autonomous district, shall be the co-Chairperson, *ex officio*;

(*c*) the Chief Executive Officer of the District Authority, *ex officio*;

(*d*) the Superintendent of Police, *ex officio*;

(*e*) the Chief Medical Officer of the district, *ex officio*;

(*f*) not exceeding two other district level officers, to be appointed by the State Government.

(*3*) In any district where zila parishad exists, the Chairperson thereof shall be the co-Chairperson of the District Authority.

(*4*) The State Government shall appoint an officer not below the rank of Additional Collector or Additional District Magistrate or Additional Deputy Commissioner, as the case may be, of the district to be the Chief Executive Officer of the District Authority to exercise such powers and perform such functions as may be prescribed by the State Government and such other powers and functions as may be delegated to him by the District Authority.

26. Powers of Chairperson of District Authority.—(*1*) The Chairperson of the District Authority shall, in addition to presiding over the meetings of the District Authority, exercise and discharge such powers and functions of the District Authority as the District Authority may delegate to him.

(*2*) The Chairperson of the District Authority shall, in the case of an emergency, have power to exercise all or any of the powers of the District Authority but the exercise of such powers shall be subject to *ex post facto* ratification of the District Authority.

(*3*) The District Authority or the Chairperson of the District Authority may, by general or special order, in writing, delegate such of its or his powers and functions, under sub-section (*1*) or (*2*), as the case may be, to the Chief Executive Officer of the District Authority, subject to such conditions and limitations, if any, as it or he deems fit.

27. Meetings.—The District Authority shall meet as and when necessary and at such time and place as the Chairperson may think fit.

28. Constitution of advisory committees and other committees.—(*1*) The District Authority may, as and when it considers necessary, constitute one or more advisory committees and other committees for the efficient discharge of its functions.

(*2*) The District Authority shall, from amongst its members, appoint the Chairperson of the Committee referred to in sub-section (*1*).

(*3*) Any person associated as an expert with any committee or sub-committee constituted under sub-section (*1*) may be paid such allowances as may be prescribed by the State Government.

29. Appointment of officers and other employees of District Authority.—The State Government shall provide the District Authority with such officers, consultants and other employees as it considers necessary for carrying out the functions of District Authority.

30. Powers and functions of District Authority.—(*1*) The District Authority shall act as the district planning, coordinating and implementing body for disaster management and take all measures for the purposes of disaster management in the district in accordance with the guidelines laid down by the National Authority and the State Authority.

(*2*) Without prejudice to the generality of the provisions of sub-section (*1*), the District Authority may—

(*i*) prepare a disaster management plan including district response plan for the district;

(*ii*) coordinate and monitor the implementation of the National Policy, State Policy, National Plan, State Plan and District Plan;

(*iii*) ensure that the areas in the district vulnerable to disasters are identified and measures for the prevention of disasters and the mitigation of its effects are undertaken by the departments of the Government at the district level as well as by the local authorities;

(*iv*) ensure that the guidelines for prevention of disasters, mitigation of its effects, preparedness and response measures as laid down by the National Authority and the State Authority are followed by all departments of the Government at the district level and the local authorities in the district;

(*v*) give directions to different authorities at the district level and local authorities to take such other measures for the prevention or mitigation of disasters as may be necessary;

(*vi*) lay down guidelines for prevention of disaster management plans by the department of the Government at the districts level and local authorities in the district;

(*vii*) monitor the implementation of disaster management plans prepared by the Departments of the Government at the district level;

(*viii*) lay down guidelines to be followed by the Departments of the Government at the district level for purposes of integration of measures for prevention of disasters and mitigation in their development plans and projects and provide necessary technical assistance therefor;

(*ix*) monitor the implementation of measures referred to in clause (*viii*);

(*x*) review the state of capabilities for responding to any disaster or threatening disaster situation in the district and give directions to the relevant departments or authorities at the district level for their up gradation as may be necessary;

(*xi*) review the preparedness measures and give directions to the concerned departments at the district level or other concerned authorities where necessary for bringing the preparedness measures to the levels required for responding effectively to any disaster or threatening disaster situation;

(*xii*) organise and coordinate specialised training programmes for different levels of officers, employees and voluntary rescue workers in the district;

(*xiii*) facilitate community training and awareness programmes for prevention of disaster or mitigation with the support of local authorities, governmental and non-governmental organisations;

(*xiv*) set up, maintain, review and upgrade the mechanism for early warnings and dissemination of proper information to public;

(*xv*) prepare, review and update district level response plan and guidelines;

(*xvi*) coordinate response to any threatening disaster situation or disaster;

(*xvii*) ensure that the Departments of the Government at the district level and the local authorities prepare their response plans in accordance with the district response plan;

(*xviii*) lay down guidelines for, or give direction to, the concerned Department of the Government at the district level or any other authorities within the local limits of the district to take measures to respond effectively to any threatening disaster situation or disaster;

(*xix*) advise, assist and coordinate the activities of the Departments of the Government at the district level, statutory bodies and other governmental and non-governmental organisations in the district engaged in the disaster management;

(*xx*) coordinate with, and give guidelines to, local authorities in the district to ensure that measures for the prevention or mitigation of threatening disaster situation or disaster in the district are carried out promptly and effectively;

(*xxi*) provide necessary technical assistance or give advise to the local authorities in the district for carrying out their functions;

(*xxii*) review development plans prepared by the Departments of the Government at the district level, statutory authorities or local authorities with a view to make necessary provisions therein for prevention of disaster or mitigation;

(*xxiii*) examine the construction in any area in the district and, if it is of the opinion that the standards for the prevention of disaster or mitigation laid down for such construction is not being or has not been followed, may direct the concerned authority to take such action as may be necessary to secure compliance of such standards;

(*xxiv*) identify buildings and places which could, in the event of any threatening disaster situation or disaster, be used as relief centers or camps and make arrangements for water supply and sanitation in such buildings or places;

(*xxv*) establish stockpiles of relief and rescue materials or ensure preparedness to make such materials available at a short notice;

(*xxvi*) provide information to the State Authority relating to different aspects of disaster management;

(*xxvii*) encourage the involvement of non-governmental organisations and voluntary social-welfare institutions working at the grassroots level in the district for disaster management;

(*xxviii*) ensure communication systems are in order, and disaster management drills are carried out periodically;

(*xxix*) perform such other functions as the State Government or State Authority may assign to it or as it deems necessary for disaster management in the District.

31. District Plan.—(*1*) There shall be a plan for disaster management for every district of the State.

(*2*) The District Plan shall be prepared by the District Authority, after consultation with the local authorities and having regard to the National Plan and the State Plan, to be approved by the State Authority.

(*3*) The District Plan shall include—

(*a*) the areas in the district vulnerable to different forms of disasters;

(*b*) the measures to be taken, for prevention and mitigation of disaster, by the Departments of the Government at the district level and local authorities in the district;

(*c*) the capacity-building and preparedness measures required to be taken by the Departments of the Government at the district level and the local authorities in the district to respond to any threatening disaster situation or disaster;

(*d*) the response plans and procedures, in the event of a disaster, providing for—

(*i*) allocation of responsibilities to the Departments of the Government at the district level and the local authorities in the district;

(*ii*) prompt response to disaster and relief thereof;

(*iii*) procurement of essential resources;

(*iv*) establishment of communication links; and

(*v*) the dissemination of information to the public;

(*e*) such other matters as may be required by the State Authority.

(*4*) The District Plan shall be reviewed and updated annually.

(*5*) The copies of the District Plan referred to in sub-sections (*2*) and (*4*) shall be made available to the Departments of the Government in the district.

(*6*) The District Authority shall send a copy of the District Plan to the State Authority which shall forward it to the State Government.

(*7*) The District Authority shall, review from time to time, the implementation of the Plan and issue such instructions to different departments of the Government in the district as it may deem necessary for the implementation thereof.

32. Plans by different authorities at district level and their implementation.—Every office of the Government of India and of the State Government at the district level and the local authorities shall, subject to the supervision of the District Authority,—

(*a*) prepare a disaster management plan setting out the following, namely:—

(*i*) provisions for prevention and mitigation measures as provided for in the District Plan and as is assigned to the department or agency concerned;

(*ii*) provisions for taking measures relating to capacity-building and preparedness as laid down in the District Plan;

(*iii*) the response plans and procedures, in the event of, any threatening disaster situation or disaster;

(*b*) coordinate the preparation and the implementation of its plan with those of the other organisations at the district level including local authority, communities and other stakeholders;

(*c*) regularly review and update the plan; and

(*d*) submit a copy of its disaster management plan, and of any amendment thereto, to the District Authority.

33. Requisition by the District Authority.—The District Authority may by order require any officer or any Department at the district level or any local authority to take such measures for the prevention or mitigation of disaster, or to effectively respond to it, as may be necessary, and such officer or department shall be bound to carry out such order.

34. Powers and functions of District Authority in the event of any threatening disaster situation or disaster.—For the purpose of assisting, protecting or providing relief to the community, in response to any threatening disaster situation or disaster, the District Authority may—

(*a*) give directions for the release and use of resources available with any Department of the Government and the local authority in the district;

(*b*) control and restrict vehicular traffic to, from and within, the vulnerable or affected area;

(*c*) control and restrict the entry of any person into, his movement within and departure from, a vulnerable or affected area;

(*d*) remove debris, conduct search and carry out rescue operations;

(*e*) provide shelter, food, drinking water and essential provisions, healthcare and services;

(*f*) establish emergency communication systems in the affected area;

(*g*) make arrangements for the disposal of the unclaimed dead bodies;

(*h*) recommend to any Department of the Government of the State or any authority or body under that Government at the district level to take such measures as are necessary in its opinion;

(*i*) require experts and consultants in the relevant fields to advise and assist as it may deem necessary;

(*j*) procure exclusive or preferential use of amenities from any authority or person;

(*k*) construct temporary bridges or other necessary structures and demolish structures which may be hazardous to public or aggravate the effects of the disaster;

(*l*) ensure that the non-governmental organisations carry out their activities in an equitable and non-discriminatory manner;

(*m*) take such other steps as may be required or warranted to be taken in such a situation.

CHAPTER V

MEASURES BY THE GOVERNMENT FOR DISASTER MANAGEMENT

35. Central Government to take measures.—(*1)* Subject to the provisions of this Act, the Central Government shall take all such measures as it deems necessary or expedient for the purpose of disaster management.

(*2*) In particular and without prejudice to the generality of the provisions of sub-section (*1*), the measures which the Central Government may take under that sub-section include measures with respect to all or any of the following matters, namely:—

(*a*) coordination of actions of the Ministries or Departments of the Government of India, State Governments, National Authority, State Authorities, governmental and non-governmental organisations in relation to disaster management;

(*b*) ensure the integration of measures for prevention of disasters and mitigation by Ministries or Departments of the Government of India into their development plans and projects;

(*c*) ensure appropriate allocation of funds for prevention of disaster, mitigation, capacity-building and preparedness by the Ministries or Departments of the Government of India;

(*d*) ensure that the Ministries or Departments of the Government of India take necessary measures for preparedness to promptly and effectively respond to any threatening disaster situation or disaster;

(*e*) cooperation and assistance to State Governments, as requested by them or otherwise deemed appropriate by it;

(*f*) deployment of naval, military and air forces, other armed forces of the Union or any other civilian personnel as may be required for the purposes of this Act;

(*g*) coordination with the United Nations agencies, international organisations and governments of foreign countries for the purposes of this Act;

(*h*) establish institutions for research, training, and developmental programmes in the field of disaster management;

(*i*) such other matters as it deems necessary or expedient for the purpose of securing effective implementation of the provisions of this Act.

(*3*) The Central Government may extend such support to other countries affected by major disaster as it may deem appropriate.

36. Responsibilities of Ministries or Departments of Government of India.—It shall be the responsibility of every Ministry or Department of the Government of India to—

(*a*) take measures necessary for prevention of disasters, mitigation, preparedness and capacity-building in accordance with the guidelines laid down by the National Authority;

(*b*) integrate into its development plans and projects, the measures for prevention or mitigation of disasters in accordance with the guidelines laid down by the National Authority;

(*c*) respond effectively and promptly to any threatening disaster situation or disaster in accordance with the guidelines of the National Authority or the directions of the National Executive Committee in this behalf;

(*d*) review the enactments administered by it, its policies, rules and regulations, with a view to incorporate therein the provisions necessary for prevention of disasters, mitigation or preparedness;

(*e*) allocate funds for measures for prevention of disaster, mitigation, capacity-building and preparedness;

(*f*) provide assistance to the National Authority and State Governments for—

(*i*) drawing up mitigation, preparedness and response plans, capacity-building, data collection and identification and training of personnel in relation to disaster management;

(*ii*) carrying out rescue and relief operations in the affected area;

(*iii*) assessing the damage from any disaster;

(*iv*) carrying out rehabilitation and reconstruction;

(*g*) make available its resources to the National Executive Committee or a State Executive Committee for the purposes of responding promptly and effectively to any threatening disaster situation or disaster, including measures for—

(*i*) providing emergency communication in a vulnerable or affected area;

(*ii*) transporting personnel and relief goods to and from the affected area;

(*iii*) providing evacuation, rescue, temporary shelter or other immediate relief;

(*iv*) setting up temporary bridges, jetties and landing places;

(*v*) providing, drinking water, essential provisions, healthcare, and services in an affected area;

(*h*) take such other actions as it may consider necessary for disaster management.

37. Disaster management plans of Ministries or Departments of Government of India.—(*1*) Every Ministry or Department of the Government of India shall—

(*a)* prepare a disaster management plan specifying the following particulars, namely:—

(*i*) the measures to be taken by it for prevention and mitigation of disasters in accordance with the National Plan;

(*ii*) the specifications regarding integration of mitigation measures in its development plans in accordance with the guidelines of the National Authority and the National Executive Committee;

(*iii*) its roles and responsibilities in relation to preparedness and capacity-building to deal with any threatening disaster situation or disaster;

(*iv*) its roles and responsibilities in regard to promptly and effectively responding to any threatening disaster situation or disaster;

(*v*) the present status of its preparedness to perform the roles and responsibilities specified in sub-clauses (*iii*) and (*iv*);

(*vi*) the measures required to be taken in order to enable it to perform its responsibilities specified in sub-clauses (*iii*) and (*iv*);

(*b*) review and update annually the plan referred to in clause (*a*);

(*c*) forward a copy of the plan referred to in clause (*a*) or clause (*b*), as the case may be, to the Central Government which Government shall forward a copy thereof to the National Authority for its approval.

(*2*) Every Ministry or Department of the Government of India shall—

(*a*) make, while preparing disaster management plan under clause (*a*) of sub-section (*1*), provisions for financing the activities specified therein;

(*b*) furnish a status report regarding the implementation of the plan referred to in clause (*a*) of sub-section (*1*) to the National Authority, as and when required by it.

38. State Government to take measures.—(*1*) Subject to the provisions of this Act, each State Government shall take all measures specified in the guidelines laid down by the National Authority and such further measures as it deems necessary or expedient, for the purpose of disaster management.

(*2*) The measures which the State Government may take under sub-section (*1*) include measures with respect to all or any of the following matters, namely:—

(*a*) coordination of actions of different departments of the Government of the State, the State Authority, District Authorities, local authority and other non-governmental organisations;

(*b*) cooperation and assistance in the disaster management to the National Authority and National Executive Committee, the State Authority and the State Executive Committee, and the District Authorities;

(*c*) cooperation with, and assistance to, the Ministries or Departments of the Government of India in disaster management, as requested by them or otherwise deemed appropriate by it;

(*d*) allocation of funds for measures for prevention of disaster, mitigation, capacity-building and preparedness by the departments of the Government of the State in accordance with the provisions of the State Plan and the District Plans;

(*e*) ensure that the integration of measures for prevention of disaster or mitigation by the departments of the Government of the State in their development plans and projects;

(*f*) integrate in the State development plan, measures to reduce or mitigate the vulnerability of different parts of the State to different disasters;

(*g*) ensure the preparation of disaster management plans by different departments of the State in accordance with the guidelines laid down by the National Authority and the State Authority;

(*h*) establishment of adequate warning systems up to the level of vulnerable communities;

(*i*) ensure that different departments of the Government of the State and the District Authorities take appropriate preparedness measures;

(*j*) ensure that in a threatening disaster situation or disaster, the resources of different departments of the Government of the State are made available to the National Executive Committee or the State Executive Committee or the District Authorities, as the case may be, for the purposes of effective response, rescue and relief in any threatening disaster situation or disaster;

(*k*) provide rehabilitation and reconstruction assistance to the victims of any disaster; and

(*l*) such other matters as it deems necessary or expedient for the purpose of securing effective implementation of provisions of this Act.

39. Responsibilities of departments of the State Government.—It shall be the responsibility of every department of the Government of a State to—

(*a*) take measures necessary for prevention of disasters, mitigation, preparedness and capacity-building in accordance with the guidelines laid down by the National Authority and the State Authority;

(*b*) integrate into its development plans and projects, the measures for prevention of disaster and mitigation;

(*c*) allocate funds for prevention of disaster, mitigation, capacity-building and preparedness;

(*d*) respond effectively and promptly to any threatening disaster situation or disaster in accordance with the State Plan, and in accordance with the guidelines or directions of the National Executive Committee and the State Executive Committee;

(*e*) review the enactments administered by it, its policies, rules and regulations with a view to incorporate therein the provisions necessary for prevention of disasters, mitigation or preparedness;

(*f*) provide assistance, as required, by the National Executive Committee, the State Executive Committee and District Authorities, for—

(*i*) drawing up mitigation, preparedness and response plans, capacity-building, data collection and identification and training of personnel in relation to disaster management;

(*ii*) assessing the damage from any disaster;

(*iii*) carrying out rehabilitation and reconstruction;

(*g*) make provision for resources in consultation with the State Authority for the implementation of the District Plan by its authorities at the district level;

(*h*) make available its resources to the National Executive Committee or the State Executive Committee or the District Authorities for the purposes of responding promptly and effectively to any disaster in the State, including measures for—

(*i*) providing emergency communication with a vulnerable or affected area;

(*ii*) transporting personnel and relief goods to and from the affected area;

(*iii*) providing evacuation, rescue, temporary shelter or other immediate relief;

(*iv*) carrying out evacuation of persons or live-stock from an area of any threatening disaster situation or disaster;

(*v*) setting up temporary bridges, jetties and landing places;

(*vi*)providing drinking water, essential provisions, healthcare and services in an affected area;

(*i*) such other actions as may be necessary for disaster management.

40. Disaster management plan of departments of State.—(*1*) Every department of the State Government, in conformity with the guidelines laid down by the State Authority, shall—

(*a*) prepare a disaster management plan which shall lay down the following :—

(*i*) the types of disasters to which different parts of the State are vulnerable;

(*ii*) integration of strategies for the prevention of disaster or the mitigation of its effects or both with the development plans and programmes by the department;

(*iii*) the roles and responsibilities of the department of the State in the event of any threatening disaster situation or disaster and emergency support function it is required to perform;

(*iv*) present status of its preparedness to perform such roles or responsibilities or emergency support function under sub-clause (*iii*);

(*v*) the capacity-building and preparedness measures proposed to be put into effect in order to enable the Ministries or Departments of the Government of India to discharge their responsibilities under section 37;

(*b*) annually review and update the plan referred to in clause (*a*); and

(*c*) furnish a copy of the plan referred to in clause (*a*) or clause (*b*), as the case may be, to the State Authority.

(*2*) Every department of the State Government, while preparing the plan under sub-section (*1*), shall make provisions for financing the activities specified therein.

(*3*) Every department of the State Government shall furnish an implementation status report to the State Executive Committee regarding the implementation of the disaster management plan referred to in sub-section (*1*).

CHAPTER VI

LOCAL AUTHORITIES

41. Functions of the local authority.—(*1*) Subject to the directions of the District Authority, a local authority shall—

(*a*) ensure that its officers and employees are trained for disaster management;

(*b*) ensure that resources relating to disaster management are so maintained as to be readily available for use in the event of any threatening disaster situation or disaster;

(*c*) ensure all construction projects under it or within its jurisdiction conform to the standards and specifications laid down for prevention of disasters and mitigation by the National Authority, State Authority and the District Authority;

(*d*) carry out relief, rehabilitation and reconstruction activities in the affected area in accordance with the State Plan and the District Plan.

(*2*) The local authority may take such other measures as may be necessary for the disaster management.

CHAPTER VII

NATIONAL INSTITUTEOF DISASTER MANAGEMENT

42. National Institute of Disaster Management.—(*1*) With effect from such date as the Central Government may, by notification in the Official Gazette appoint in this behalf, there shall be constituted an institute to be called the National Institute of Disaster Management.

(*2*) The National Institute of Disaster Management shall consist of such number of members as may be prescribed by the Central Government.

(*3*) The term of office of, and vacancies among, members of the National Institute of Disaster Management and manner of filling such vacancies shall be such as may be prescribed.

(*4*) There shall be a governing body of the National Institute of Disaster Management which shall be constituted by the Central Government from amongst the members of the National Institute of Disaster Management in such manner as may be prescribed.

(*5*) The governing body of the National Institute of Disaster Management shall exercise such powers and discharge such functions as may be prescribed by regulations.

(*6*) The procedure to be followed in exercise of its powers and discharge of its functions by the governing body, and the term of office of, and the manner of filling vacancies among the members of the governing body, shall be such as may be prescribed by regulations.

(*7*) Until the regulations are made under this section, the Central Government may make such regulations; and any regulation so made may be altered or rescinded by the National Institute of Disaster Management in exercise of its powers.

(*8*) Subject to the provisions of this Act, the National Institute of Disaster Management shall function within the broad policies and guidelines laid down by the National Authority and be responsible for planning and promoting training and research in the area of disaster management, documentation and development of national level information base relating to disaster management policies, prevention mechanisms and mitigation measures.

(*9*) Without prejudice to the generality of the provisions contained in sub-section (*8*), the National Institute, for the discharge of its functions, may—

(*a*) develop training modules, undertake research and documentation in disaster management and organise training programmes;

(*b*) formulate and implement a comprehensive human resource development plan covering all aspects of disaster management;

(*c*) provide assistance in national level policy formulation;

(*d*) provide required assistance to the training and research institutes for development of training and research programmes for stakeholders including Government functionaries and undertake training of faculty members of the State level training institutes;

(*e*) provide assistance to the State Governments and State training institutes in the formulation of State level policies, strategies, disaster management framework and any other assistance as may be required by the State Governments or State training institutes for capacity-building of stakeholders, Government including its functionaries, civil society members, corporate sector and people's elected representatives;

(*f*) develop educational materials for disaster management including academic and professional courses;

(*g*) promote awareness among stakeholders including college or school teachers and students, technical personnel and others associated with multi-hazard mitigation, preparedness and response measures;

(*h*) undertake, Organise and facilitate study courses, conferences, lectures, seminars within and outside the country to promote the aforesaid objects;

(*i*) undertake and provide for publication of journals, research papers and books and establish and maintain libraries in furtherance of the aforesaid objects;

(*j*) do all such other lawful things as are conducive or incidental to the attainment of the above objects; and

(*k*) undertake any other function as may be assigned to it by the Central Government.

43. Officers and other employees of the National Institute.—The Central Government shall provide the National Institute of Disaster Management with such officers, consultants and other employees, as it considers necessary, for carrying out its functions.

CHAPTER VIII

NATIONAL DISASTER RESPONSE FORCE

44. National Disaster Response Force.—(*1*) There shall be constituted a National Disaster Response Force for the purpose of specialist response to a threatening disaster situation or disaster.

(*2*) Subject to the provisions of this Act, the Force shall be constituted in such manner and, the conditions of service of the members of the Force, including disciplinary provisions therefore, be such as may be prescribed.

45. Control, direction, etc.—The general superintendence, direction and control of the Force shall be vested and exercised by the National Authority and the command and supervision of the Force shall vest in an officer to be appointed by the Central Government as the Director General of the National Disaster Response Force.

CHAPTER IX

FINANCE, ACCOUNTS AND AUDIT

46. National Disaster Response Fund.—(*1*) The Central Government may, by notification in the Official Gazette, constitute a fund to be called the National Disaster Response Fund for meeting any threatening disaster situation or disaster and there shall be credited thereto—

(*a*) an amount which the Central Government may, after due appropriation made by Parliament by law in this behalf provide;

(*b*) any grants that may be made by any person or institution for the purpose of disaster management.

(*2*) The National Disaster Response Fund shall be made available to the National Executive Committee to be applied towards meeting the expenses for emergency response, relief and rehabilitation in accordance with the guidelines laid down by the Central Government in consultation with the National Authority.

47. National Disaster Mitigation Fund.—(*1*) The Central Government may, by notification in the Official Gazette, constitute a Fund to be called the National Disaster Mitigation Fund for projects exclusively for the purpose of mitigation and there shall be credited thereto such amount which the Central Government may, after due appropriation made by Parliament by law in this behalf, provide.

(*2*) The National Disaster Mitigation Fund shall be applied by the National Authority.

48. Establishment of funds by State Government.—(*1*) The State Government shall, immediately after notifications issued for constituting the State Authority and the District Authorities, establish for the purposes of this Act the following funds, namely:—

(*a*) the fund to be called the State Disaster Response Fund;

(*b*) the fund to be called the District Disaster Response Fund;

(*c*) the fund to be called the State Disaster Mitigation Fund;

(*d*) the fund to be called the District Disaster Mitigation Fund.

(*2*) The State Government shall ensure that the funds established—

(*i*) under clause (*a*) of sub-section *(1*) is available to the State Executive Committee;

(*ii*) under sub-clause (*c*) of sub-section (*1*) is available to the State Authority;

(*iii*) under clauses (*b*) and (*d*) of sub-section (*1*) are available to the District Authority.

49. Allocation of funds by Ministries and Departments.—(*1*) Every Ministry or Department of the Government of India shall make provisions, in its annual budget, for funds for the purposes of carrying out the activities and programmes set out in its disaster management plan.

(*2*) The provisions of sub-section (*1*) shall, *mutatis mutandis*, apply to departments of the Government of the State.

50. Emergency procurement and accounting.—Where by reason of any threatening disaster situation or disaster, the National Authority or the State Authority or the District Authority is satisfied that immediate procurement of provisions or materials or the immediate application of resources are necessary for rescue or relief,—

(*a*) it may authorise the concerned department or authority to make the emergency procurement and in such case, the standard procedure requiring inviting of tenders shall be deemed to be waived;

(*b*) a certificate about utilisation of provisions or materials by the controlling officer authorised by the National Authority, State Authority or District Authority, as the case may be, shall be deemed to be a valid document or voucher for the purpose of accounting of emergency, procurement of such provisions or materials.

CHAPTER X

OFFENCES AND PENALTIES

51. Punishment for obstruction, etc.—Whoever, without reasonable cause—

(*a*) obstructs any officer or employee of the Central Government or the State Government, or a person authorised by the National Authority or State Authority or District Authority in the discharge of his functions under this Act; or

(*b*) refuses to comply with any direction given by or on behalf of the Central Government or the State Government or the National Executive Committee or the State Executive Committee or the District Authority under this Act,

shall on conviction be punishable with imprisonment for a term which may extend to one year or with fine, or with both, and if such obstruction or refusal to comply with directions results in loss of lives or imminent danger thereof, shall on conviction be punishable with imprisonment for a term which may extend to two years.

52. Punishment for false claim.—Whoever knowingly makes a claim which he knows or has reason to believe to be false for obtaining any relief, assistance, repair, reconstruction or other benefits consequent to disaster from any officer of the Central Government, the State Government, the National Authority, the State Authority or the District Authority, shall, on conviction be punishable with imprisonment for a term which may extend to two years, and also with fine.

53. Punishment for misappropriation of money or materials, etc.—Whoever, being entrusted with any money or materials, or otherwise being, in custody of, or dominion over, any money or goods, meant for providing relief in any threatening disaster situation or disaster, misappropriates or appropriates for his own use or disposes of such money or materials or any part thereof or wilfully compels any other person so to do, shall on conviction be punishable with imprisonment for a term which may extend to two years, and also with fine.

54. Punishment for false warning.—Whoever makes or circulates a false alarm or warning as to disaster or its severity or magnitude, leading to panic, shall on conviction, be punishable with imprisonment which may extend to one year or with fine.

55. Offences by Departments of the Government.—(*1*) Where an offence under this Act has been committed by any Department of the Government, the head of the Department shall be deemed to be guilty of the offence and shall be liable to be proceeded against and punished accordingly unless he proves that the offence was committed without his knowledge or that he exercised all due diligence to prevent the commission of such offence.

(*2*) Notwithstanding anything contained in sub-section (*1*), where an offence under this Act has been committed by a Department of the Government and it is proved that the offence has been committed with the consent or connivance of, or is attributable to any neglect on the part of, any officer, other than the head of the Department, such officer shall be deemed to be guilty of that offence and shall be liable to be proceeded against and punished accordingly.

56. Failure of officer in duty or his connivance at the contravention of the provisions of this Act.—Any officer, on whom any duty has been imposed by or under this Act and who ceases or refuses to perform or withdraws himself from the duties of his office shall, unless he has obtained the express written permission of his official superior or has other lawful excuse for so doing, be punishable with imprisonment for a term which may extend to one year or with fine.

57. Penalty for contravention of any order regarding requisitioning.—If any person contravenes any order made under section 65, he shall be punishable with imprisonment for a term which may extend to one year or with fine or with both.

58. Offence by companies.—(*1*) Where an offence under this Act has been committed by a company or body corporate, every person who at the time the offence was committed, was in charge of, and was responsible to, the company, for the conduct of the business of the company, as well as the company,

shall be deemed to be guilty of the contravention and shall be liable to be proceeded against and punished accordingly:

Provided that nothing in this sub-section shall render any such person liable to any punishment provided in this Act, if he proves that the offence was committed without his knowledge or that he exercised due diligence to prevent the commission of such offence.

(*2*) Notwithstanding anything contained in sub-section (*1*), where an offence under this Act has been committed by a company, and it is proved that the offence was committed with the consent or connivance of or is attributable to any neglect on the part of any director, manager, secretary or other officer of the company, such director, manager, secretary or other officer shall also, be deemed to be guilty of that offence and shall be liable to be proceeded against and punished accordingly.

Explanation.—For the purpose of this section—

(*a*) "company" means any body corporate and includes a firm or other association of individuals; and

(*b*) "director", in relation to a firm, means a partner in the firm.

59. Previous sanction for prosecution.—No prosecution for offences punishable under sections 55 and 56 shall be instituted except with the previous sanction of the Central Government or the State Government, as the case may be, or of any officer authorised in this behalf, by general or special order, by such Government.

60. Cognizance of offences.—No court shall take cognizance of an offence under this Act except on a complaint made by—

(*a*) the National Authority, the State Authority, the Central Government, the State Government, the District Authority or any other authority or officer authorised in this behalf by that Authority or Government, as the case may be; or

(*b*) any person who has given notice of not less than thirty days in the manner prescribed, of the alleged offence and his intention to make a complaint to the National Authority, the State Authority, the Central Government, the State Government, the District Authority or any other authority or officer authorised as aforesaid.

CHAPTER XI

MISCELLANEOUS

61. Prohibition against discrimination.—While providing compensation and relief to the victims of disaster, there shall be no discrimination on the ground of sex, caste, community, descent or religion.

62. Power to issue direction by Central Government.—Notwithstanding anything contained in any other law for the time being in force, it shall be lawful for the Central Government to issue direction in writing to the Ministries or Departments of the Government of India, or the National Executive Committee or the State Government, State Authority, State Executive Committee, statutory bodies or any of its officers or employees, as the case may be, to facilitate or assist in the disaster management and such Ministry or Department or Government or Authority, Executive Committee, statutory body, officer or employee shall be bound to comply with such direction.

63. Powers to be made available for rescue operations.—Any officer or authority of the Union or a State, when requested by the National Executive Committee, any State Executive Committee or District Authority or any person authorised by such Committee or Authority in this behalf, shall make available to that Committee or authority or person, such officers and employees as requested for, to perform any of the functions in connection with the prevention of disaster or mitigation or rescue or relief work.

64. Making or amending rules, etc., in certain circumstances.—Subject to the provisions of this Act, if it appears to the National Executive Committee, State Executive Committee or the District Authority, as the case may be, that provisions of any rule, regulation, notification, guideline, instruction, order, scheme or bye-laws, as the case may be, are required to be made or amended for the purposes of prevention of disasters or the mitigation thereof, it may require the amendment of such rules, regulation,

notification, guidelines, instruction, order, scheme or bye-laws, as the case may be, for that purpose, and the appropriate department or authority shall take necessary action to comply with the requirements.

65. Power of requisition of resources, provisions, vehicles, etc., for rescue operations, etc.—(*1*) If it appears to the National Executive Committee, State Executive Committee or District Authority or any officer as may be authorised by it in this behalf that—

(*a*) any resources with any authority or person are needed for the purpose of prompt response;

(*b*) any premises are needed or likely to be needed for the purpose of rescue operations; or

(*c*) any vehicle is needed or is likely to be needed for the purposes of transport of' resources from disaster affected areas or transport of resources to the affected area or transport in connection with rescue, rehabilitation or reconstruction,

such authority may, by order in writing, requisition such resources or premises or such vehicle, as the case may be, and may make such further orders as may appear to it to be necessary or expedient in connection with the requisitioning.

(*2*) Whenever any resource, premises or vehicle is requisitioned under sub-section (*1*), the period of such requisition shall not extend beyond the period for which such resource, premises or vehicle is required for any of the purposes mentioned in that sub-section.

(*3*) In this section,—

(*a*) "resources" includes men and material resources;

(*b*) "services" includes facilities;

(*c*) "premises" means any land, building or part of a building and includes a hut, shed or other structure or any part thereof;

(*d*) "vehicle" means any vehicle used or capable of being used for the purpose of transport, whether propelled by mechanical power or otherwise.

66. Payment of compensation.— (*1*) Whenever any Committee, Authority or officer referred to in sub-section (*1*) of section 65, in pursuance of that section requisitions any premises, there shall be paid to the persons interested compensation the amount of which shall be determined by taking into consideration the following, namely:—

(*i*) the rent payable in respect of the premises, or if no rent is so payable, the rent payable for similar premises in the locality;

(*ii*) if as consequence of the requisition of the premises the person interested is compelled to change his residence or place of business, the reasonable expenses (if any) incidental to such change:

Provided that where any person interested being aggrieved by the amount of compensation so determined makes an application within the thirty days to the Central Government or the State Government, as the case may be, for referring the matter to an arbitrator, the amount of compensation to be paid shall be such as the arbitrator appointed in this behalf by the Central Government or the State Government, as the case may be, may determine:

Provided further that where there is any dispute as to the title to receive the compensation or as to the apportionment of the amount of compensation, it shall be referred by the Central Government or the State Government, as the case may be, to an arbitrator appointed in this behalf by the Central Government or the State Government, as the case may be, for determination, and shall be determined in accordance with the decision of such arbitrator.

*Explanatio*n.—In this sub-section, the expression "person interested" means the person who was in actual possession of the premises requisitioned under section 65 immediately before the requisition, or where no person was in such actual possession, the owner of such premises.

(*2*) Whenever any Committee, Authority or officer, referred to in sub-section (*1*) of section 65 in pursuance of that section requisitions any vehicle, there shall be paid to the owner thereof compensation the mount of which shall be determined by the Central Government or the State Government, as the case may be, on the basis of the fares or rates prevailing in the locality for the hire of such vehicle:

Provided that where the owner of such vehicle being aggrieved by the amount of compensation so determined makes an application within the prescribed time to the Central Government or the State Government, as the case may be, for referring the matter to an arbitrator, the amount of compensation to be paid shall be such as the arbitrator appointed in this behalf by the Central Government or the State Government, as the case may be, may determine:

Provided further that where immediately before the requisitioning the vehicle or vessel was by virtue of a hire purchase agreement in the possession of a person other than the owner, the amount determined under this sub-section as the total compensation payable in respect of the requisition shall be apportioned between that person and the owner in such manner as they may agree upon, and in default of agreement, in such manner as an arbitrator appointed by the Central Government or the State Government, as the case may be, in this behalf may decide.

67. Direction to media for communication of warnings, etc.—The National Authority, the State Authority, or a District Authority may recommend to the Government to give direction to any authority or person in control of any audio or audio-visual media or such other means of communication as may be available to carry any warning or advisories regarding any threatening disaster situation or disaster, and the said means of communication and media as designated shall comply with such direction.

68. Authentication of orders or decisions.—Every order or decision of the National Authority or the National Executive Committee, the State Authority, or the State Executive Committee or the District Authority, shall be authenticated by such officers of the National Authority or the National Executive Committee or, the State Executive Committee, or the District Authority, as may be authorised by it in this behalf.

69. Delegation of powers.—The National Executive Committee, State Executive Committee, as the case may be, by general or special order in writing, may delegate to the Chairperson or any other member or to any officer, subject to such conditions and limitations, if any, as may be specified in the order, such of its powers and functions under this Act as it may deem necessary.

70. Annual report.—(*1*) The National Authority shall prepare once every year, in such form and at such time as may be prescribed, an annual report giving a true and full account of its activities during the previous year and copies thereof shall be forwarded to the Central Government and that Government shall cause the same to be laid before both Houses of Parliament within one month of its receipt.

(*2*) The State Authority shall prepare once in every year, in such form and at such time as may be prescribed, an annual report giving a true and full account of its activities during the previous year and copies thereof shall be forwarded to the State Government and that Government shall cause the same to be laid before each House of the State Legislature where it consists of two Houses, or where such Legislature consists of one House, before that House.

71. Bar of jurisdiction of court.—No court (except the Supreme Court or a High Court) shall have jurisdiction to entertain any suit or proceeding in respect of anything done, action taken, orders made, direction, instruction or guidelines issued by the Central Government, National Authority, State Government, State Authority or District Authority in pursuance of any power conferred by, or in relation to its functions, by this Act.

72. Act to have overriding effect.—The provisions of this Act, shall have effect, notwithstanding anything inconsistent therewith contained in any other law for the time being in force or in any instrument having effect by virtue of any law other than this Act.

73. Action taken in good faith.—No suit or prosecution or other proceeding shall lie in any court against the Central Government or the National Authority or the State Government or the State Authority or the District Authority or local authority or any officer or employee of the Central Government or the National Authority or the State Government or the State Authority or the District Authority or local authority or any person working for on behalf of such Government or authority in respect of any work done or purported to have been done or intended to be done in good faith by such authority or Government or such officer or employee or such person under the provisions of this Act or the rules or regulations made thereunder.

74. Immunity from legal process.—Officers and employees of the Central Government, National Authority, National Executive Committee, State Government, State Authority, State Executive Committee or District Authority shall be immune from legal process in regard to any warning in respect of any impending disaster communicated or disseminated by them in their official capacity or any action taken or direction issued by them in pursuance of such communication or dissemination.

75. Power of Central Government to make rules.—(*1*) The Central Government may, by notification in the Official Gazette, make rules for carrying out the purposes of this Act.

(*2*) In particular, and without prejudice to the generality of the foregoing power, such rules may provide for all or any of the following matters, namely:—

(*a*) the composition and number of the members of the National Authority under sub-section (*2*), and the term of office and conditions of service of members of the National Authority under sub-section (*4*), of section 3;

(*b*) the allowances to be paid to the members of the advisory committee under sub-section (*2*) of section 7;

(*c*) the powers and functions of the Chairperson of the National Executive Committee under sub-section (*3*) of section 8 and the procedure to be followed by the National Executive Committee in exercise of its powers and discharge of its functions under sub-section (*4*) of section 8;

(*d*) allowances to be paid to the persons associated with the sub-committee constituted by the National Executive Committee under sub-section (*3*) of section 9;

(*e*) the number of members of the National Institute of Disaster Management under sub-section (*2*), the term of the office and vacancies among members and the manner of filling such vacancies under sub-section (*3*) and the manner of constituting the Governing Body of the National Institute of Disaster Management under sub-section (*4*) of section 42;

(*f*) the manner of constitution of the Force, the conditions of service of the members of the Force, including disciplinary provisions under sub-section (*2*) of section 44;

(*g*) the manner in which notice of the offence and of the intention to make a complaint to the National Authority, the State Authority, the Central Government, the State Government or the other authority or officer under clause (*b*) of section 60;

(*h*) the form in which and the time within which annual report is to be prepared under section 70;

(*i*) any other matter which is to be, or may be, prescribed, or in respect of which provision is to be made by rules.

76. Power to make regulations.—(*1*) The National Institute of Disaster Management, with the previous approval of the Central Government may, by notification in the Official Gazette, make regulations consistent with this Act and the rules made thereunder to carry out the purposes of this Act.

(*2*) In particular, and without prejudice to the generality of the foregoing power, such regulations may provide for all or any of the following matters, namely:—

(*a*) powers and functions to be exercised and discharged by the governing body;

(*b*) procedure to be followed by the governing body in exercise of the powers and discharge of its functions;

(*c*) any other matter for which under this Act provision may be made by the regulations.

77. Rules and regulations to be laid before Parliament.—Every rule made by the Central Government and every regulation made by the National Institute of Disaster Management under this Act shall be laid, as soon as may be after it is made, before each House of Parliament, while it is in session, for a total period of thirty days which may be comprised of one session or in two or more successive sessions, and if, before the expiry of the session immediately following the session or the successive sessions aforesaid, both Houses agree in making any modification in the rule or regulation or both Houses agree that the rule or regulation should not be made, the rule or regulation shall thereafter have effect only

in such modified form or be of no effect, as the case may be; so, however, that any such modification or annulment shall be without prejudice to the validity of anything previously done under that rule or regulation.

78. Power of State Government to make rules.—(*1*) The State Government may, by notification in the Official Gazette, make rules to carry out the provisions of this Act.

(*2*) In particular, and without prejudice to the generality of the foregoing power, such rules may provide for all or any of the following matters, namely:—

(*a*) the composition and number of the members of the State Authority under sub-section (*2*), and the term of office and conditions of service of the members of the State Authority under sub-section (*5*), of section 14;

(*b*) the allowances to be paid to the members of the advisory committee under sub-section (*2*) of section 17;

(*c*) the powers and functions of the Chairperson of the State Executive Committee under sub-section (*3*), and the procedure to be followed by the State Executive Committee in exercise of its powers and discharge of its functions under sub-section (*4*) of section 20;

(*d*) allowances to be paid to the persons associated with the sub-committee constituted by the State Executive Committee under sub-section (*3*) of section 21;

(*e*) the composition and the number of members of the District Authority under sub-section (*2*), and the powers and functions to be exercised and discharged by the Chief Executive Officer of the District Authority under sub-section (*3*) of section 25;

(*f*) allowances payable to the persons associated with any committee constituted by the District Authority as experts under sub-section (*3*) of section 28;

(*g*) any other matter which is to be, or may be, prescribed, or in respect of which provision is to be made by rules.

(*3*) Every rule made by the State Government under this Act shall be laid, as soon as may be after it is made, before each House of the State Legislature where it consists of two Houses, or where such Legislature consists of one House before that House.

79. Power to remove difficulties.—(*1*) If any difficulty arises in giving effect to the provisions of this Act, the Central Government or the State Government, as the case may be, by notification in the Official Gazette, make order not inconsistent with the provisions of this Act as may appear to it to be necessary or expedient for the removal of the difficulty:

Provided that no such order shall be made after the expiration of two years from the commencement of this Act.

(*2*) Every order made under this section shall be laid, as soon as may be after it is made, before each House of Parliament or the Legislature, as the case may be.

Course Content

Human Anatomy **First M.B.B.S. (From August 2019)**

(Based on Medical Council of India, Competency based Undergraduate curriculum for the Indian Medical Graduate, 2018. Vol. 1; page no.41-90)

Teaching Lectures(hours)-220 Self directed learning (hours)- 40 **hours**

Small group teachings/tutorials/Integrated teaching/Practicals(hours)-415 Total(hours) -675 Early clinical exposure(hours)- 90 to be divided equally in all three subjects .

Competency No.	Topics & Subtopics
1	**Anatomical Terminology**
AN1.1	Anatomical position planes, movement in our body
AN1.2	Composition of bone & bone marrow
2	**General features of bones & Joints**
AN2.1	Parts, blood and nerve supply of long bone
AN2.2	Laws of ossification
AN2.3	Features of sesamoid bone
AN2.4	Cartilage
AN2.5	Types of Joints & examples
AN2.6	Nerve supply of joints & Hilton's law
3	**General features of Muscle**
AN3.1	Classification of muscles
AN3.2	Parts of skeletal muscle
AN3.3	Shunt and spurt muscles

4	**General features of skin and fascia**
AN4.1	Types of skin& dermatomes in body
AN4.2	Structure & function of skin
AN4.3	Superficial fascia
AN4.4	Deep fascia
AN4.5	Principles of skin incisions
5	**General features of the cardiovascular system**
AN5.1	Blood Lymph & vascular system
AN5.2	Pulmonary and systemic circulation
AN5.3	Arteries & Veins
AN5.4	Functional Classification of Vessels
AN5.5	Portal System
AN5.6	Anastomoses
AN5.7	Meta-arterioles, sphincters & AV anastomoses
AN5.8	Thrombosis, infarction & aneurysm
6	**General Features of lymphatic system**
AN6.1	Components & functions of Lymphatic system
AN6.2	Lymph capillaries & Circulation
AN6.3	Lymphoedema & tumor spread

7	**Introduction to the nervous system**
AN7.1	General plan & components of CNS, ANS, PNS.
AN7.2	Components of nervous tissue & functions
AN7.3	Classifications & parts of neuron
AN7.4	Typical spinal nerve
AN7.5	Principles of innervation of muscles
AN7.6	Loss of innervation of a muscle and applied anatomy
AN7.7	Synapse –types
AN7.8	Ganglia

8	**Features of individual bones (Upper Limb)**
AN8.1	Bones of upper limb
AN8.2	Joints formed by bones of upper limb
AN8.3	Peculiarities of clavicle
AN8.4	Muscle attachments of bones
AN8.5	Articulated hand
AN8.6	Scaphoid fracture
9	**Pectoral region**
AN9.1	Pectoralis major & pectoralis minor
AN9.2	Breast
AN9.3	Development of breast

10	**Axilla, Shoulder and Scapular region**
AN10.1	Boundaries & Contents of axilla
AN10.2	Axillary artery & Vein
AN10.3	Brachial plexus
AN10.4	Axillary lymphnodes
AN10.5	Variation in brachial plexus
AN10.6	Erb's Palsy & klumpke's paralysis
AN10.7	Enlarged axillary lymph nodes
AN10.8	Trapezius and latissimus dorsi
AN10.9	Anastomosis around the scapula & triangle of auscultation
AN10.10	Deltoid and rotator cuff muscles
AN10.11	Serratus anterior
AN10.12	Shoulder joint
AN10.13	Axillary nerve injury during IM injections

11	**Arm & Cubital fossa**
AN11.1	Biceps & triceps brachii
AN11.2	Important nerves and vessels in arm
AN11.3	Venipuncture of cubital veins
AN11.4	Saturday night palsy

AN11.5	Cubital fossa
AN11.6	Elbow joint anastomosis
12	**Forearm & hand**
AN12.1	Muscle groups of ventral forearm
AN12.2	Nerves & vessels of forearm
AN12.3	Flexor retinaculum
AN12.4	Carpal tunnel syndrome
AN12.5	Muscles of hand. movements of thumb
AN12.6	Movements of thumb
AN12.7	Vessels & nerves in hand
AN12.8	Claw hand
AN12.9	Fibrous flexor sheaths, synovial sheaths
AN12.10	Infection of Fascial spaces of palm
AN12.11	Muscle groups of dorsal forearm
AN12.12	Nerves and vessels of back of forearm
AN12.13	Wrist drop
AN12.14	Extensor retinaculum
AN12.15	Extensor expansion formation
13	**General Features, Joints, radiographs & surface marking**
AN13.1	Fascia, compartments, veins & lymphatic of upper limbs
AN13.2	Dermatomes of upper limbs
AN13.3	Joints of upper limb Elbow, Radio-ulnar, wrist & first carpometacarpal joint)

AN13.4	Joints of upper limb Sternoclavicular, Acromioclavicular, Carpometacarpal joints & Metacarpophalangeal joints
AN13.5	Radiographs of UL
AN13.6	Bony landmarks of UL
AN13.7	Surface projection of vessels, testing of muscle
AN13.8	Development of UL
14	**Features of individual bones (Lower Limb)**
AN14.1	Features of given bones
AN14.2	Joints formed by given bone
AN14.3	Importance of ossification of femur & tibia
AN14.4	Articulated foot
15	**Front & Medial side of thigh**
AN15.1	Nerves & vessels of thigh
AN15.2	Major Muscles
AN15.3	Femoral triangle
AN15.4	Psoas abscess & Femoral hernia
AN15.5	Adductor canal
16	**Gluteal region & back of thigh**

AN16.1	Nerves and vessels
AN16.2	Sciatic nerve injury
AN16.3	Trendelenburg sign
AN16.4	Hamstrings muscle
AN16.5	Nerve & vessels of back of thigh
AN16.6	Popliteal fossa
17	**Hip Joint**
AN17.1	Details of hip joint
AN17.2	Fracture neck of femur
AN17.3	Dislocation
18	**Knee joint, Anterolateral compartment of leg & dorsum of foot**
AN18.1	Major muscles
AN18.2	Nerves & vessels
AN18.3	Foot drop
AN18.4	Knee joint
AN18.5	Locking and unlocking
AN18.6	Knee joint injuries with its applied anatomy
AN18.7	Osteoarthritis
19	**Back of leg & sole**
AN19.1	Major muscles
AN19.2	Nerves & Vessels

AN19.3	Peripheral heart
AN19.4	Rupture of calcaneal tendon
AN19.5	Arches of foot
AN19.6	Flat & club foot
AN19.7	Metatarsalgia & plantar fasciitis
20	**General Features, joints, radiographs & surface marking**
AN20.1	Tibiofibular & ankle joint
AN20.2	Subtalar and transverse tarsal joints
AN20.3	Fascia, venous drainage, lymphatic Retinacula & dermatomes of Lower limb
AN20.4	Enlarged inguinal lymph nodes
AN20.5	Varicose veins & deep vein thrombosis
AN20.6	Radiographs of lower limb
AN20.7	Bony landmarks
AN20.8	Vessels of lower limb palpation
AN20.9	Surface projection nerves & veins
AN20.10	Development of lower limb
21	**Thoracic cage**
AN21.1	Sternum,Typical Rib, first Rib & typical thoracic vertebra
AN21.2	A typical Ribs & vertebra
AN21.3	Thoracic inlet, cavity and outlet

AN21.4	Intercostal muscles
AN21.5	Typical intercostal nerve
AN21.6	Intercostal vessels
AN21.7	A typical intercostal nerve subcostal artery, superior Artery
AN21.8	Joints of thorax
AN21.9	Mechanics of respiration
AN21.10	Costochondral & interchondral joints
AN21.11	Mediastinum
22	**Heart & Pericardium**
AN22.1	Pericardium
AN22.2	Each chamber of heart
AN22.3	Coronary arteries
AN22.4	Ischemic heart disease
AN22.5	Coronary sinus
AN22.6	Fibrous skeleton of heart
AN22.7	Conducting system of heart
23	**Mediastinum**
AN23.1	Oesophagus
AN23.2	Thoracic duct
AN23.3	Superior venacava , Azygos, hemiazygos & accessory hemiazygos veins
AN23.4	Arch of aorta & descending aorta

AN23.5	Thoracic sympathetic chain
AN23.6	Splanchnic nerves
AN23.7	Lymphatic duct
24	**Lungs & Trachea**
AN24.1	Pleura, Pleural, recess & applied anatomy
AN24.2	Root of lung & bronchial tree
AN24.3	Broncho pulmonary segment
AN24.4	Phrenic nerve
AN24.5	Blood Supply nerve supply Lymphatic drainage of Lungs
AN24.6	Trachea
25	**Thorax**
AN25.1	Draw & label microanatomy of trachea and lung
AN25.2	Development of pleura, lung & heart
AN25.3	Fetal circulation
AN25.4	Atrial septal defect, Ventricular septal defect, Fallot's tetralogy & Tracheo-oesophageal fistula
AN25.5	Transposition of great vessels, Dextrocardia, Patent ductus arteriosus & Coarctation of aorta
AN25.6	Development of aortic arch arteries, SVC, IVC & coronary Sinus.
AN25.7	Chest Radiograph AP & Lateral view
AN25.8	Barium swallow
AN25.9	Surface projection of pleura heart lungs
26	Skull osteology

AN26.1	Anatomy of skull bones
AN26.2	Skull Norma
AN26.3	Interior of skull
AN26.4	Mandible
AN26.5	Typical and Atypical cervical vertebrae (Atlas & axis)
AN26.6	Bones that ossify in membrane
AN26.7	7th cervical vertebra
27	Scalp
AN27.1	Scalp, Blood supply,nerve supply, Layers & Surgical importance
AN27.2	Emmissary veins
28	Face & parotid region
AN28.1	Facial muscles
AN28.2	Nerve supply of facial muscles
AN28.3	Facial vessels
AN28.4	Facial Nerve
AN28.5	Cervical Lymph node
AN28.6	Superficial muscles of face
AN28.7	Facial Nerve Palsy
AN28.8	Deep facial vein
AN28.9	Parotid gland
AN28.10	Frey’s syndrome Can be covered with 28.3

29	**Posterior triangle of neck**
AN29.1	Sternocleidomastoid
AN29.2	Erb's & Klumpke's palsy
AN29.3	wry neck
AN29.4	Omohyoid, scalenus & levator scapulae
30	**Cranial cavity**
AN30.1	Cranial fossa
AN30.2	Foramina
AN30.3	Dural venous sinuses
AN30.4	Cavernous sinuses
AN30.5	Visual Pathways
31	**Orbit**
AN31.1	Extra ocular muscles
AN31.2	Nerves and vessels in the orbit
AN31.3	Horner's syndrome
AN31.4	Lacrimal apparatus
AN31.5	3rd, 4th & 6th Cranial Nerves
32	**Anterior Triangle**
AN32.1	Anterior triangle
AN32.2	Carotid, muscular, digastric and submental triangles
33	**Temporal and Infratemporal regions**

AN33.1	Temporal & infratemporal fossae
AN33.2	Muscle of mastication
AN33.3	Temporomandibular joint
AN33.4	Pterygoid venous plexus
AN33.5	Dislocation with Temporomandibular joint
34	**Submandibular region**
AN34.1	Submandibular Salivary Gland & Ganglion
AN34.2	Submandibular stones
35	**Deep Structures in the neck**
AN35.1	Deep Cervical Fascia
AN35.2	Thyroid gland
AN35.3	Subclavian Artery
AN35.4	internal jugular & Brachiocephalic vein
AN35.5	Cervical lymph nodes
AN35.6	Cervical Sympathetic chain
AN35.7	IX, X, XI, & XII, Cranial nerve
AN35.8	Thyroid Swellings
AN35.9	Clinical features of compression by Cervical rib
AN35.10	Fascial Spaces of neck
36	**Mouth, pharynx & palate**

AN36.1	1) Soft palate 2) Palatine tonsil
AN36.2	Waldeyer's Lymphatic Ring
AN36.3	Pyriform fossa & Applied
AN36.4	Tonsils & Adenoids with applied anatomy
AN36.5	Clinical significance of Kilian's dehiscence
37	**Cavity of Nose**
AN37.1	Nasal septum, lateral wall of Nose,
AN37.2	Paranasal sinuses
AN37.3	Maxillary sinus –Applied Anatomy
38	Larynx
AN38.1	Intrinsic & Extrinsic muscles of larynx
AN38.2	Anatomical aspects of laryngitis
AN38.3	Recurrent laryngeal nerve Injury
39	**Tongue**
AN39.1	Tongue
AN39.2	XII Cranial hypoglossal Applied Anatomy
40	**Organs of hearing and equilibrium**
AN40.1	External ear

AN40.2	Middle ear
AN40.3	Internal ear
AN40.4	Applied Anatomy otitis externa / media
AN40.5	Myringotomy
41	**Eyeball**
AN41.1	Eyeball
AN41.2	Eyeball applied cataract, glaucoma & central retinal artery occlusion
AN41.3	Intraocular muscles
42	**Back region**
AN42.1	Vertebral canal
AN42.2	Sub occipital triangle
AN42.3	Semi spinalis capitis & Splenius Capitis
43	**Head & neck joints, Histology, Development , Radiography & surface marking**
AN43.1	Movements with muscles producing the movements of atlantooccipital joint & atlantoaxial joint
AN43.2	Pituitary , Thyroid, parathyroid & Salivary gland tongue, Epiglottis, Cornea, Retina
AN43.3	Microanatomy of olfactory epithelium, Eyelid, lip. Optic nerve, pineal gland
AN43.4	Development and anomalies of face, palate, tongue, brachial apparatus pituitary gland, Thyroid, Eye
AN43.5	Muscles of facial Expression, extraocular muscles palpation of carotid, superficial temporal, facial arteries, location of internal jugular & Ext. jugular veins. hyoid bone, thyroid cartilage, cricoid cartilage

AN43.6	Surface anatomy thyroid, parotid gland common carotid artery, IJV, SCV, EJV, facial artery.
AN43.7	X-Ray skull AP & Lat. view
AN43.8	Carotid & vertebral Angiogram
AN43.9	Structures in carotid & vertebral angiogram
44	**Anterior abdominal wall**
AN44.1	Planes, Quadrants of abdomen.
AN44.2	Fascia, nerves & Blood supply of ant. Abdominal wall.
AN44.3	Rectus sheath
AN44.4	Inguinal canal
AN44.5	Inguinal Hernia
AN44.6	Muscles of Ant. Abdominal wall
AN44.7	Common Abdominal Incisions
45	**Posterior abdominal wall**
AN45.1	Thoracolumbar fascia
AN45.2	Lumbar plexus
AN45.3	Back muscles
46	**Male external genitalia**
AN46.1	Testis & its descent
AN46.2	Epididymis
AN46.3	Penis
AN46.4	Varicocele
AN46.5	Phimosis & circumcision

47	**Abdominal cavity**
AN47.1	Lesser & Greater sac
AN47.2	Peritoneal folds & pouches
AN47.3	Ascites & peritonitis
AN47.4	Sub phrenic Abscess
AN47.5	Major Viscera
AN47.6	Accessory spleen, Kehr's sign, Vagotomy, Liver biopsy
AN47.7	Calot's triangle
AN47.8	Portal vein, Inferior Vena Cava, Renal vein
AN47.9	Abdominal aorta, coeliac trunk
AN47.10	Portosystemic Anastomosis
AN47.11	Portal Hypertension
AN47.12	Nerve plexus post. Abdominal wall.
AN47.13	Thoraco abdominal diaphragm
AN47.14	Diaphragmatic Hernia
48	**Pelvic wall and viscera**
AN48.1	Muscles of pelvic diaphragm
AN48.2	Male & female pelvic viscera
AN48.3	Internal iliac Artery
AN48.4	Sacral plexus
AN48.5	BPH, Uterine anomalies anal fistula
AN48.6	Automatic bladder

AN48.7	BPH & prostate cancer
AN48.8	P/V & P/R examination
49	**Perineum**
AN49.1	Sup. & deep perineal pouch
AN49.2	Perineal body
AN49.3	Perineal Membrane in male & female
AN49.4	Ischiorectal fossa
AN49.5	Perineal tear, episiotomy perineal abscess & Anal fissure
50	**Vertebral Column**
AN50.1	Curvatures of vertebral Column
AN50.2	Intervertebral joint & sacroiliac joint, Pubic symphysis
AN50.3	Lumbar puncture
AN50.4	Scoliosis, lordosis, PID, Spina bifida, Spondylolisthesis
51	**Sectional Anatomy**
AN51.1	Cross section at T8, T10, & L1
AN51.2	Midsagittal section male & female pelvis
52	**Histology & Embryology**
AN52.1	GIT
AN52.2	Excretory system
AN52.3	Cardiooesophageal junction, Corpus luteum

AN52.4	Development of anterior abdominal wall
AN52.5	Congenital anomalies of Diaphragm
AN52.6	Congenital anomalies of foregut midgut hindgut
AN52.7	Urinary System Development
AN52.8	Reproductive system Development
53	**Osteology**
AN53.1	Bone – Identification, anatomical position, articulations & attachments
AN53.2	Bony pelvis
AN53.3	Bones of abdominopelvic region
AN53.4	Clinical importance of bones of abdominopelvic region
54	**Radio diagnosis**
AN54.1	KUB plain X Ray abdomen
AN54.2	(contrast X ray Barium swallow, Barium meal, Barium enema,) Cholecystography, intravenous pyelography & Hysterosalpingography
AN54.3	ERCP, CT abdomen, MRI Arteriography in radio diagnosis of abdomen
55	**Surface marking**
AN55.1	Surface projections of regions and planes of abdomen , superficial inguinal ring, deep inguinal ring, Mc Burney's point, renal angle & murphy's point
AN55.2	Surface marking of stomach, Liver, Fundus of gall bladder, Spleen, Duodenum, Pancreas, lleocaecal junction, Kidneys & Root of mesentery
56	**Meninges & CSF**

AN56.1	Various layers of meninges with its extent & modifications
AN56.2	Formation and circulation of CSF with its applied anatomy
57	**Spinal Cord**
AN57.1	External features of spinal cord
AN57.2	Extent of spinal cord in child & adult with its clinical implication
AN57.3	Transverse section of spinal cord at mid-cervical & midthoracic level
AN57.4	Ascending & descending tracts at mid thoracic level of spinal cord
AN57.5	Describe anatomical basis of syringomyelia
58	**Medulla Oblongata**
AN58.1	External features of medulla oblongata
AN58.2	Transverse section of medulla oblongata at the level of 1) pyramidal decussation 2) sensory decussation 3) ION
AN58.3	Cranial nerve nuclei in medulla oblongata with their functional group
AN58.4	Anatomical basis & effects of medial & lateral medullary Syndrome
59	**Pons**
AN59.1	External features of pons
AN59.2	Transverse section of pons at the upper and lower level
AN59.3	Cranial nerve nuclei in pons with their functional group
60	**Cerebellum**
AN60.1	External & internal features of cerebellum
AN60.2	Connections of cerebellar cortex and intracerebellar nuclei
AN60.3	Anatomical basis of cerebellar dysfunction

61	**Midbrain**
AN61.1	External & internal features of midbrain
AN61.2	Internal features of midbrain at the level of superior & inferior colliculus
AN61.3	Anatomical basis & effects of benedikt's and weber's syndrome
62	**Cranial nerve nuclei & cerebral hemispheres**
AN62.1	Cranial nerve nuclei with its functional component
AN62.2	Surfaces, sulci, gyri, poles & functional areas of cerebral hemisphere
AN62.3	White matter of cerebrum
AN62.4	Parts & major connections of basal ganglia & limbic lobe
AN62.5	Boundaries, parts, gross relation, major nuclei and connections of dorsal thalamus, hypothalamus, epithalamus, metathalamus and subthalamus
AN62.6	Formation, branches & major areas of distribution of circle of willis
63	**Ventricular System**
AN63.1	Parts, boundaries & features of 3^{rd}, 4^{th} & lateral ventricle
AN63.2	Describe anatomical basis of congenital hydrocephalus
64	**Histology & Embryology**
AN64.1	Micro anatomical features of spinal cord, cerebellum & cerebrum
AN64.2	Development of neural tube, spinal cord, medulla oblongata, pons, midbrain, cerebral hemisphere& cerebellum

AN64.3	Various types of open neural tube defects with its embryological basis
65	**Epithelium histology**
AN65.1	Types of epithelium under the microscope & describe the various types that correlate to its function
AN65.2	Ultrastructure of epithelium
66	**Connective tissue histology**
AN66.1	Various types of connective tissue with functional correlation
AN66.2	Ultrastructure of connective tissue
67	**Muscle histology**
AN67.1	Various types of muscle under the microscope
AN67.2	Classification of various types of muscle and describe the structure-function correlation of the same
AN67.3	Ultrastructure of muscular tissue
	Nervous tissue histology
AN68.1	Multipolar & unipolar neuron, ganglia, peripheral nerve
AN68.2	Structure-function correlation of neuron
AN68.3	Ultrastructure of nervous tissue
69	**Blood Vessels**
AN69.1	Elastic & muscular blood vessels, capillaries under the microscope
AN69.2	Various types and structure-function correlation of blood vessel
AN69.3	Describe the ultrastructure of blood vessels
70	**Glands & Lymphoid tissue**
AN70.1	Various exocrine gland under the microscope & distinguish between serous, mucous and mixed acini

AN70.2	Identify the lymphoid tissue under the microscope & describe microanatomy of lymph, node, spleen, thymus, tonsil and correlate the structure with function
71	**Bone & Cartilage**
AN71.1	Bones under the microscope classify various types & describe the structure – Function correlation of the same
AN71.2	Structure of cartilage under the microscope & describe various types and structure-function correlation of the same
	Integumentary system
AN72.3	Skin and its appendages under the microscope and correlate the structure with function
	Chromosomes
AN73.1	Structure of chromosomes with classification
AN73.2	Technique of karyotyping with its applications
AN73.3	Lyon's hypothesis
	Patterns of inheritance
AN74.1	Various modes of inheritance with examples
AN74.2	Pedigree charts for the various types of inheritance & give examples of diseases of each mode of inheritance
AN74.3	Multifactorial inheritance with examples
AN74.4	Genetic basis & clinical features of Achondroplasia, Cystic Fibrosis, Vitamin D resistant rickets, Haemophilia, Duchene's muscular dystrophy & sickle cell anaemia
75	**Principle of Genetics, Chromosomal Aberrations & Clinical Genetics**
AN75.1	Structural and numerical chromosomal aberrations
AN75.2	Mosaics and chimeras with example
AN75.3	Genetic basis & clinical features of prader willi syndrome, Edward syndrome & patau syndrome
AN75.4	Genetic basis of variation : polymorphism and mutation

AN75.5	Principles of genetic counselling
76	**Introduction to embryology**
AN76.1	Stages of human life
AN76.2	Phylogeny, ontogeny, trimester, viability
77	**Gametogenesis and fertilization**
AN77.1	Uterine changes occurring during the menstrual cycle
AN77.2	Synchrony between the ovarian and menstrual cycles
AN77.3	Spermatogenesis and oogenesis along with diagrams
AN77.4	Stages and consequences of fertilization
AN77.5	Anatomical principles underlying contraception
AN77.6	Teratogenic influences, Fertility & sterility, surrogate motherhood, social significance of “sex-ratio”.
78	**Second week of development**
AN78.1	Cleavage and formation of blastocyst
AN78.2	Development of trophoblast
AN78.3	Process of implantation & common abnormal sites of implantation
AN78.4	Formation of extra –embryonic mesoderm and coelom, bilaminar disc and prochordal plate
AN78.5	Abortion; deciducal reaction, pregnancy test
79	**3rd to 8th week of development**
AN79.1	Formation & fate of the primitive streak
AN79.2	Development of trophoblast , fate of Notochord
AN79.3	Process of neurulation

AN79.4	Describe the development of somites and intra-embryonic coelom
AN79.5	Embryological basis of congenital malformations, nucleus pulposus, sacrococcygeal teratomas, neural tube defects
AN79.6	Describe the diagnosis of pregnancy in first trimester and role of teratogens, alpha-fetoprotein
80	**Fetal membranes**
AN80.1	Formation , functions & fate of chorion; amnion; yolk sac; allantois & decidua
AN80.2	Formation & structure of umbilical cord
AN80.3	Formation of placenta, its physiological functions, foetomaternal circulation & placental barrier
AN80.4	Embryological basis of twinning in monozygotic & dizygotic twins
AN80.5	Role of placental hormones in uterine growth & parturition
AN80.6	Embryological basis of estimation of fetal age.
AN80.7	Various types of umbilical cord attachments
81	**Prenatal Diagnosis**
AN81.1	Various methods of prenatal diagnosis
AN81.2	Indications, process and disadvantages of amniocentesis
AN81.3	Indications, process and disadvantages of chorion villus biopsy
82	**Ethics in anatomy**
AN82.1	Respect and follow the corrected procedure when handling cadavers and other biologic tissue

Paper wise distribution of topics for Prelim & MUHS Annual Examination

Year: First MBBS Subject: Anatomy

Paper	Section	Topics
I	A	MCQs on all topics of the paper I
	B & C	Superior extremity
		General embryology
		Genetics
		Head , neck , face
		Central nervous system
		One short answer question on AETCOM module 1.1 & 1.5
		Scenario based / application questions can be on any topic of the paper I
		For long answer question and scenario based / application questions , region will not be repeated
II	A	MCQs on all topics of the paper II
	B & C	General Anatomy
		General histology
		Gross Anatomy of Abdomen and Pelvis
		Gross Anatomy of Inferior extremity
		Thorax
		Scenario based / application questions can be on any topic of the paper II
		For long answer question and scenario based / application questions , region will not be repeated

Internal Assessment

Anatomy

Applicable w.e.f August 2019 onwards examination for batches admitted from June 2019 onwards

Sr. No	**I-Exam (December)**			**II-Exam (March)**		
	Theory	Practical (Including 05 Marks for Journal & Log Book)	Total Marks	Theory	Practical Including 05 Marks for Journal & Log Book	Total Marks
1	100	50	150	100	50	150

Sr. No	Preliminary Examinations			Sr. No	Remedial internal assessment examination for **Non - eligible** students		
	III-Exam **(July)**				**October**		
	Theory	Practical Including 10 Marks for Journal & Log Book	Total Marks		Theory	Practical Including 10 Marks for Journal & Log Book	Total Marks
1	200	100	300	1	200	100	300

1. There will be 3 internal assessment examinations in the academic year. The structure of Preliminary examinations should be similar to the structure of University examination.
2. There will be only one additional examination for absent students (due to genuine reason) after approval by the Committee Constituted for the same. It should be taken after preliminary examination and before submission of internal assessment marks to the University.
3. First internal assessment examination will be held in December, second internal assessment examination will be held in March and third internal assessment examination will be held in July.
4. Internal assessment marks for theory and practical will be converted to out of 40. Internal assessment marks, after Conversion, should be submitted to university by 7th of August.
5. The student must secure at least 50% marks for total marks (combined in theory and practical / clinical: not less than 40% marks in theory and practical separately) assigned for internal assessment in a particular subject in order to be eligible for appearing at the final university examination of that subject. Internal assessment marks will reflect as separate head of passing at the summative examination.
6. **Remedial internal assessment examination for Non - eligible students**: Student who were not eligible due to less than 50% combined or less than 40% in any theory or practical, will re appear as repeater student for Prelim exam which will be conducted before Supplementary Exam. His/her internal assessment will be calculated on the basis of this Examination marks only. Students who will not be eligible in this Examination will appear with regular batch as repeater student.
7. The internal assessment marks of the remedial examination alone shall be considered and converted into out of 40.
8. Conversion **Formula for calculation of marks in internal assessment examinations**

	First IA	Second IA	Third IA (Prelim)	Total	Internal assessment marks: Conversion formula (out of 40)	Eligibility to appear for final University examination (after conversion out of 40) (40% Separately in Theory and Practical, 50% Combined)	
Theory	100	100	200	400	$\frac{\text{Total marks obtained}}{10}$	16 (minimum)	Total of Theory + Practical Must be 40.
Practical	50	50	100	200	$\frac{\text{Total marks obtained}}{5}$	16 (minimum)	

9. Conversion formula for calculation of marks in Remedial internal assessment examination

	Remedial Exam (Prelim)	Int. Assess. marks conversion formula (out of 40)	Eligibility to appear for Supplementary Exam. (after conversion out of 40) (40% Separately in Theory and Practical, 50% Combined)	
Theory	200	$\frac{\text{Total marks obtained}}{5}$	16 (minimum)	Total of Theory + Practical Must be 40.
Practical	100	$\frac{\text{Total marks obtained}}{2.5}$	16 (minimum)	

While preparing Final Marks of Internal Assessment, the rounding-off marks shall done as illustrated in following table

Internal Assessment Marks	**Final rounded marks**
15.01 to 15.49	15
15.50 to 15.99	16

First Year MBBS Practical Mark's Structure Internal Assessment Examinations I & II (Applicable for batch admitted in M.B.B.S Course from Academic Year 2019-20 & onwards)

Anatomy Practical										
Seat No.	**Soft Part**	**Micro Anatomy (5 Spots)**	**Micro Anatomy slide for Discussion (1 slide)**	**Hard Part (Bones)**	**Embryology Models**	**Clinical Anatomy Including Genetics charts (2 spots)**	**Journal/ Logbook**	**Radiology**	**Living Anatomy**	**Practical Total**
	A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**
Max. Marks	**10**	**05**	**05**	**05**	**05**	**05**	**05**	**05**	**05**	**50**

First Year MBBS Practical Mark's Structure (Prelim)

Applicable w.e.f August 2019 onwards examination for batches admitted from June 2019 onwards

Anatomy													
Practical									Oral/Viva				Total
Seat No.	Soft Part	Micro Anatomy (10 Spots)	Micro Anatomy slides for Discussion (2 slides)	Axial Skeleton	Embryology Models	Clinical Anatomy Including Genetic charts (2 Spots)	Journal /logbook	Total	Appendicular Skeleton	X - ray	Surface Living Anatomy	Total	PR/Oral Total
	A	B	C	D	E	F	G	H	I	J	K	L	M
Max. Marks	25	10	05	10	10	10	10	80	10	05	05	20	100

(Please Note - The above examination pattern will be applicable to the students admitted from Academic Year 2019-20 and onwards, which is informed to all Medical Colleges vide University letter No MUHS /X-1 /UG /1692 /2020 Date: 28/02/2020)

First Year MBBS Practical Mark's Structure (MUHS Exam)

Applicable w.e.f August 2019 onwards examination for batches admitted from June 2019 onwards

Anatomy												
Practical								Oral/Viva				Total
Seat No.	Soft Part	Micro Anatomy (10 Spots)	Micro Anatomy slides for Discussion (2 slides)	Axial Skeleton	Embryology Models	Clinical Anatomy Including Genetic charts (2 Spots)	Total	Appendicular Skeleton	Radiology	Surface Living Anatomy	Total	PR/Oral Total
	A	B	C	D	E	F	G	H	I	J	K	L
Max. Marks	30	10	10	10	10	10	80	10	05	05	20	100

(Please Note - The above examination pattern will be applicable to the students admitted from Academic Year 2019-20 and onwards, which is informed to all Medical Colleges vide University letter No MUHS /X-1 /UG /1692 /2020 Date: 28/02/2020)

MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES, NASHIK
FORMAT / SKELETON OF QUESTION PAPER

1. Course and Year	:	**First MBBS** *(applicable w.e.f. Sept. 2020& onwards examinations)*						2. Subject Code	: ***Appendix - a***
3. Subject (PSP)	:	**Anatomy / Physiology / Biochemistry**							
(TT)	:								
4. Paper :	:	***I***	5. Total Marks	: **100**	6. Total Time	: **3 Hrs.**		7. Remu. (PS)	: **Rs. 300/-**
								8. Remu. (PM)	: **Rs. 350/-**
9. Web Pattern	: [ ]		10. Web Skeleton	: [ ]	11. Web Syllabus	: [ ]		12. Web Old QP	: [ ]

Instructions:

SECTION "A" MCQ

1) *Fill ● (dark) the appropriate empty circle below the question number once only.*
2) *Use **blue/black** ball point pen only.*
3) *Each Question carries **One mark.***
4) *A student will not be allotted any marks if he/she overwrites, strikes out or puts white ink on the circle once filled (darkened)*
5) *Do not write anything on the blank portion of the question paper if written anything, such type of act will be considered as an attempt to resort to unfair means.*

SECTION "A" MCQ (20 Marks)

Q1. Multiple Choice Questions (Total 20 MCQ of One mark each) ***(4 MCQ Should be clinical application based)*** (20x1=20)

a) b) c) d) e) f) g) h) i) j)

k) l) m) n) o) p) q) r) s) t)

SECTION "B"

Instructions:

1) *Use **blue/black** ball point pen only.*
2) ***Do not** write anything on the **blank portion of the question paper**. If written anything, such type of act will be considered as an attempt to resort to unfair means.*
3) ***All** questions are **compulsory**.*
4) *The number to the **right** indicates **full** marks.*
5) *Draw diagrams **wherever** necessary.*
6) *Distribution of syllabus in Question Paper is only meant to cover entire syllabus within the stipulated frame. The Question paper pattern is a mere guideline. Questions can be asked from any paper's syllabus into any question paper. Students cannot claim that the Question is out of syllabus. As It is only for the placement sake, the distribution has been done.*
7) *Use a common answer book for all sections.*

SECTION "B" (80 Marks)

2. Brief answer questions (Any Ten out of Eleven) (10x 2= 20)

a) b) c) d) e) f) g) h) i) j) k)

3. Short Answer Questions (Any Eight out of Nine) (8x5= 40)

One SAQ has to be on AETCOM Module ***(For Anatomy 1.1, 1.5, For Physiology 1.2.,1.3&For Biochemistry, 1.4) &***
Minimum 2 SAQs should be Case Based Questions/ Clinically applied Questions.

a) b) c) d) e) f) g) h) i)

4. Long Answer Questions (Any Two out of Three) (2x 10= 20)

a) b) c)

Note: All questions should be structured .Wherever necessary; split up of marks should be specified.

MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES, NASHIK
FORMAT / SKELETON OF QUESTION PAPER

1. Course and Year	: **First MBBS** *(applicable w.e.f. Sept. 2020& onwards examinations)*					2. Subject Code	: ***Appendix - a***
3. Subject (PSP)	: **Anatomy / Physiology / Biochemistry**						
(TT)	:						
4. Paper :	: ***II***	5. Total Marks	: **100**	6. Total Time	: **3 Hrs.**	7. Remu. (PS)	: **Rs. 300/-**
						8. Remu. (PM)	: **Rs. 350/-**
9. Web Pattern	: [ ]	10. Web Skeleton	: [ ]	11. Web Syllabus	: [ ]	12. Web Old QP	: [ ]

Instructions:

SECTION "A" MCQ

1) *Fill ● (dark) the appropriate empty circle below the question number once only.*
2) *Use **blue/black** ball point pen only.*
3) *Each Question carries **One mark.***
4) *A student will not be allotted any marks if he/she overwrites, strikes out or puts white ink on the circle once filled (darkened)*
5) *Do not write anything on the blank portion of the question paper if written anything, such type of act will be considered as an attempt to resort to unfair means.*

SECTION "A" MCQ (20 Marks)

1. Multiple Choice Questions (Total 20 MCQ of One mark each) ***(4 MCQ Should be clinical application based)*** (20x1=20)

a) b) c) d) e) f) g) h) i) j)

k) l) m) n) o) p) q) r) s) t)

SECTION "B"

Instructions:

1) *Use **blue/black** ball point pen only.*
2) ***Do not** write anything on the **blank portion of the question paper**. If written anything, such type of act will be considered as an attempt to resort to unfair means.*
3) ***All** questions are **compulsory**.*
4) *The number to the **right** indicates **full** marks.*
5) *Draw diagrams **wherever** necessary.*
6) *Distribution of syllabus in Question Paper is only meant to cover entire syllabus within the stipulated frame. The Question paper pattern is a mere guideline. Questions can be asked from any paper's syllabus into any question paper. Students cannot claim that the Question is out of syllabus. As It is only for the placement sake, the distribution has been done.*
7) *Use a common answer book for all sections.*

SECTION "B" (80 Marks)

2. Brief answer questions (Any Ten out of Eleven) (10x 2= 20)

a) b) c) d) e) f) g) h) i) j) k)

3. Short Answer Questions (Any Eight out of Nine) (8x5= 40)

Minimum 2 SAQs should be Case Based Questions/ Clinically applied Questions.

4. a) b) c) d) e) f) g) h) i) (2x 10= 20)

Long Answer Questions (Any Two out of Three)

b) c)

Note: All questions should be structured .Wherever necessary, split up of marks should be specified.

MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES, NASHIK

MARKLIST FOR PRACTICAL / ORAL / VIVA VOCE

(Summer / Winter – 20…Exam (MBBS UG Courses)

(Applicable for batch admitted in M.B.B.S Course from Academic Year 2019-20 & onwards)

Course : FIRST MBBS **Subject : Anatomy**

CENTRE : **Marks : (Practical = Practical/Clinical + Viva) Min. 50 Max. 100**

Date : / /20 **Batch :**

Practical								Oral/Viva				Total
Seat No.	Soft Part	Histology (Spotting)	2 slide for Discussion	Axial Skeleton	Embryo	Clinical Anatomy	Practical Total	Appendicular Skeleton	X-ray	Surface Living Anatomy	Oral/Viva Total	PR/Oral Total
	A	B	C	D	E	F	G	H	I	J	K	L
Max. Marks	30	10	10	10	10	10	**80**	10	05	05	**20**	**100**

Note : Both Examiners should jointly conduct practical examination for each student.

Verified above entries from Answerbooks and we hereby certify that the marks entered against each Seat Number are found correct.

	NAME OF EXAMINER	COLLEGE	SIGNATURE WITH DATE	
1			Convenor	
2			Internal	
3			External	
4			External	

RECOMMENDED BOOKS

1) Gray's Anatomy
2) Sahana's Human Anatomy
3) Chouraia's Human Anatomy 3 volumes
4) Cunningham's manual of Practical Anatomy
5) Regional Anatomy by R. J. Last
6) Human Histology by Inderbir Singh
7) Atlas of Human Histology- DIFORE
8) Surgical Anatomy- McGregor
9) Histolgoy- by ham,
10) Human Embryology – Inderbir Singh,
11) Medical Embryology – Langman,
12) Surface Anatomy & Radiology – Halim Das,
13) General Anatomy by – Chowrisia
14) Text book of Neuroanatomy – Inderbir Singh
15) Central Nervous System – Podar Bhagat
16) Clinical anatomy for medical students – Richard Snell
17) J.S.P. Lumbley at all – M.C.Q's in Anatomy
18) Text Book of General Anatomy – V. Subhadra Devi
19) Dissection Manual with Regions & Applied Anatomy, Lower Extremity Abdomen Pelvis and Perineum Vol 2 -1 Edition 2018 - Dr. Mercy Navis
20) Dissection Manual with Regions & Applied Anatomy, Head , Neck &Brain. Mercy Navis
21) Clinical Anatomy by-Neeta V Kulkarni.
22) Salubris Prep- Manual AETCOM- PRE CLINICAL- Jyoti Gaikwad & Varsha Navgire.

Course Content

(Based on Competency Table published by Medical Council of India.Students/Teachers are directed to refer competency table published on MCI Website for details)

Subject: Biochemistry **Year: First MBBS**

Competency No.	Topics & Subtopics
1 **1.1** Describe the molecular and functional organization of a cell and its subcellular components.	**Basic Biochemistry** Molecular and functional organization of cell and its subcellular components
2	**Enzymes**
2.1 Explain fundamental concepts of enzyme, isoenzyme, alloenzyme, coenzyme & co-factors. Enumerate the main classes of IUBMB nomenclature.	Biochemical nature of enzyme, isoenzyme, alloenzyme, coenzyme & co-factors IUBMB enzyme classification
2.2 Observe the estimation of SGOT & SGPT	Estimation of SGOT (AST)& SGPT (ALT) with its normal range and clinical significance.
2.3 Describe and explain the basic principles of enzyme activity	Mechanism of enzyme action, factors affecting enzyme activity, brief concept of enzyme kinetics with special reference to V_{max} & k_m.
2.4	Enzyme inhibition. Various inhibitors as drugs and poisons

Competency No.	Topics & Subtopics
Describe and discuss enzyme inhibitors as poisons and drugs and as therapeutic enzymes	
2.5 Describe and discuss the clinical utility of various serum enzymes as markers of pathological conditions.	Diagnostic and therapeutic importance of various serum enzymes in various disorders
2.6 Discuss use of enzymes in laboratory investigations (Enzymebased assays) **2.7** Interpret laboratory results of enzyme activities & describe the clinical utility of various enzymes as markers of pathological conditions.	Analytical uses of Enzymes in laboratory investigations (enzyme based assays) Interpret various serum enzymes of liver & biliary tract, Pancreas, cardiac & skeletal muscle in various disorders
3	**Chemistry & Metabolism of Carbohydrates**
3.1 Discuss and differentiate monosaccharides, di-saccharides and polysaccharides giving examples of main carbohydrates as energy fuel, structural element and storage in the human body	Classification of carbohydrates with examples and functions of monosaccharides giving examples as energy fuel, glycosides and its therapeutic importance, disaccharides with examples and importance, polysaccharides with examples as storage form like glycogen, structural elements like glycosaminoglycan's in the human body, resistant starch, glycemic index, and dietary fiber. Clinical importance of dextran's

3.2 Describe the processes involved in digestion and assimilation of carbohydrates and storage. **3.3**	Digestion & absorption, transport and storage of carbohydrates, Lactose intolerance and sucrase deficiency disorders

Competency No.	**Topics & Subtopics**
Describe and discuss the digestion and assimilation of carbohydrates from food.	
3.4 Define and differentiate the pathways of carbohydrate metabolism(glycolysis, gluconeogenesis, glycogen metabolism, HMP shunt).	Pathway, energetics, regulation & clinical diseases / disorders of - Glycolysis including Rappaport Leubering cycle, Gluconeogenesis, Glycogenesis, Glycogenolysis , HMP pathway , Uronic acid pathway, Galactose & Fructose metabolism
3.5 Describe and discuss the regulation, functions and integration of carbohydrate along with associated diseases/disorders.	
3.6 Describe and discuss the concept of TCA cycle as a amphibolic pathway and its regulation.	TCA cycle Pathway,energetics, regulation & its concepts as amphibolic pathway
3.7 To be clubbed with 3.4 & 3.6 Describe the common poisons that inhibit crucial enzymes of carbohydrate metabolism (eg: fluoride, arsenate)	Common poisons that inhibit crucial enzymes of carbohydrate metabolism like: Iodoacetate, fluoride & arsenite as poisons that inhibit enzymes of glycolysis Fluoroacetate, arsenite & malonate as poisons that inhibit enzymes of TCA cycle

3.8 & 3.10 **3.8:** Discuss and interpret laboratory results of analytes associated with metabolism of carbohydrates. (to be clubbed with comp no 11.17- Diabetes Mellitus) **3.10** Interpret the results of blood glucose levels and other Laboratory investigations related to disorders of carbohydrate metabolism.	Interpretation of the results of blood glucose, Glycated hemoglobin & GTT as per WHO guidelines in Diabetes mellitus including gestational diabetes and other laboratory investigation like urinary glucose, urinary ketone bodies. Interpretation of the results of blood & urinary galactose levels in galactosemia. Interpretation of blood G6PD levels

Competency No.	**Topics & Subtopics**
3.9 Discuss the mechanism and significance of blood glucose regulation in health and disease.	Regulation of blood glucose in fed and fasting state in normal health & changes in diabetes mellitus.
4	**Chemistry & Metabolism of Lipids**
4.1 Describe and discuss main classes of lipids (Essential/nonessential fatty acids, cholesterol and hormonal steroids, triglycerides, major phospholipids and sphingolipids) relevant to human system and their major functions.	Definition & classification of lipids including classification of fatty acids, their nomenclature, numbering, functions & biological importance of various lipids like fatty acids, cholesterol , hormonal steroids, triglycerides, major phospholipids and sphingolipids

4.2 Describe the processes involved in digestion and absorption of dietary lipids and also the key features of their metabolism	Digestion, absorption and transport of lipids along with abnormalities like lipid malabsorption. Metabolism of fatty acids (β-oxidation of even and odd carbon fatty acids), regulation, energetics and disorders associated with oxidation of fatty acids, Formation & fate of ketone bodies, its significance, regulation and associated disorders like ketosis. In brief de novo fatty acid biosynthesis- site & organs, precursors, enzyme complex, product formed & regulatory steps. Biosynthesis of triacylglycerol and fate of triacylglycerol formed in liver & adipose tissue, its significance and regulation, Metabolic role of adipose tissue and disorders of lipid transport and storage like fatty liver. In brief Cholesterol biosynthesis- site & organs, precursors, key enzymes, product formed & regulatory step, metabolic fate & excretion

Competency No.	**Topics & Subtopics**
4.3 Explain the regulation of lipoprotein metabolism & associated disorders.	Metabolism of various lipoproteins and hyperlipoproteinemia's, hypolipoproteinemiasabetalipoproteinemias & Tangiers disease.
4.4 Describe the structure and functions of lipoproteins, their functions, interrelations & relations with atherosclerosis	Classification structure and functions of lipoproteins- (To be clubbed with 4.1) Metabolic interrelationship between various lipoproteins, Role of lipoproteins in transport of cholesterol and reverse cholesterol transport, atherosclerosis- (To be clubbed with 4.3)

4.5 & 4.7 Interpret laboratory results of analytes associated with metabolism of lipids	Various lipid profile tests with their biological reference intervals. Interpret lipid profile results in various disorders like hyper/hypolipoproteinemias, diabetes mellitus, nephrotic syndrome, disorders of thyroid etc.
4.6 Describe the therapeutic uses of prostaglandins and inhibitors of eicosanoid synthesis.	Various eicosanoid classes (prostaglandins, leukotrienes & thromboxanes), their functions. Key features of synthesis of eicosanoids and inhibitors of eicosanoid synthesis, therapeutic uses of prostaglandins
4.7 Interpret laboratory results of analytes associated with metabolism of lipids.	**Same as 4.5**
5 **5.1** Describe and discuss structural organization of proteins.	**Chemistry and Metabolism of Proteins** General nature of amino acid, classification and importance of amino acids with examples, peptide bond formation, biologically important peptides, different levels of protein structure including disulfide & weak bonds with examples and clinical significance.

Competency No.	**Topics & Subtopics**
5.2 Describe and discuss functions of proteins and structurefunction relationships in relevant areas e.g. hemoglobin and selected hemoglobinopathies	Definition, various classifications with examples and functions of proteins, plasma proteins, structure - function relationship of proteins like myoglobin, normal & abnormal hemoglobin

5.3 Describe the digestion and absorption of dietary proteins.	Digestion, absorption and transport of dietary proteins with related disorders like Hartnup disease, cystinuria & glycinuria.
5.4 Describe common disorders associated with protein metabolism.	Role of transamination & deamination reactions in metabolism of amino acids in the formation of ammonia with their clinical significance. Transport of ammonia, pathway of urea cycle, its significance, regulation and metabolic disorders associated with urea cycle. Metabolic pathways for Glycine, Phenylalanine & Tyrosine, Sulphur containing amino acids (Methionine, Cysteine & Cystine) and branch chain amino acids (Valine, Isoleucine & Leucine), their role in biosynthesis of variety of specialized biomolecules, associated metabolic disorders For Tryptophan- Only important biomolecules formed & clinical significance.
5.5 Interpret laboratory results of analytesassociated with metabolism of proteins.	Interpret laboratory results of protein metabolism for example: Levels of various metabolites in blood or urine in metabolic disorders like- urea cycle disorders, Phenylketonuria, Tyrosinemia, Alkaptonuria, Hartnups disease, MSUD, cystinuria & homocystinuria
6	**Metabolism and Homeostasis**
6.1 Discuss the metabolic processes that take place in specific organs in the body in the fed and fasting states.	Integration of carbohydrate, protein and lipid metabolism at cellular and tissue or organ level with its significance, Metabolic processes with role of specific organs in fed, fasting and starvation states.

Competency No.	**Topics & Subtopics**

6.2 Describe and discuss the metabolic processes in which nucleotides are involved.	Important steps in de novo biosynthesis of purine and pyrimidine nucleotides and their regulation, enzymes of the nucleotide biosynthesis that are inhibited by anticancer drugs, salvage pathway for the synthesis of purine nucleotides with its significance, catabolism of purine and pyrimidine nucleotides.
6.3 Describe the common disorders associated with nucleotide metabolism. **6.4** Discuss the laboratory results of analytes associated with gout & Lesch-Nyhan syndrome.	Disorder of nucleotide metabolism like gout, Lesch-Nyhan syndrome, orotic aciduria, with diagnostic tests & biochemical mechanism of nutritional & drug therapy. Lab results of analytes related with gout & Lesch-Nyhan syndrome. Levels of uric acid in blood & urine and presence of urate crystals in synovial fluid in gout, levels of uric acid in blood
6.5 Describe the biochemical role of vitamins in the body and explain the manifestations of their deficiency	Sources, biochemical functions, daily requirement and deficiency manifestations of fat soluble vitamins (Vitamin A, D, E & K). Sources, biochemical functions and deficiency manifestations of water soluble vitamins (Thiamine, Riboflavin, Niacin, Pantothenic acid, Pyridoxine, Biotin, Folic acid, Cobalamin and vitamin C)
6.6 Describe the biochemical processes involved in generation of energy in cells.	Electron transport chain, mechanism of oxidative phosphorylation (chemiosmotic theory), substrate level phosphorylation, Uncouplers & Inhibitors of electron transport chain , shuttle systems for transport of extra-mitochondrial NADH
6.7 Describe the processes involved in maintenance of normal pH, water & electrolyte balance of body fluids and the derangements associated with these.	Acids, bases and buffers, mechanism of action of buffer, dietary sources of acids, bases, normal pH of body fluids. Role of blood buffers, respiratory system & kidney in regulation of blood pH. Disorders associated with blood pH (acidosis and alkalosis) & their compensatory mechanisms, anion gap & its clinical importance.

Competency No.	Topics & Subtopics
	Total body water and its compartmental distribution, various electrolytes- sodium, potassium and chloride, their distribution and clinical conditions related to their plasma level alterations, maintenance of normal water and electrolyte balance and disorders associated with water and electrolyte imbalance.
6.8 Discuss and interpret results of Arterial Blood Gas (ABG) analysis in various disorders.	Interpretation of results of arterial blood gas (ABG) analysis in acidosis and alkalosis.
6.9 Describe the functions of various minerals in the body, their metabolism and homeostasis.	Dietary food sources, daily requirement, biochemical functions, metabolism and homeostasis of: Calcium, phosphorus & magnesium, trace elements (copper, fluoride, iodine, iron, manganese, selenium & zinc)
6.10 Enumerate and describe the disorders associated with mineral metabolism.	Clinical conditions related to plasma level alterations of: Calcium, phosphorus & magnesium Trace elements (copper, fluoride, iodine, iron, manganese, selenium & zinc)
6.11 Describe the functions of heme in the body and describe the processes involved in its metabolism and describe porphyrin metabolism	Structure and functions of hemoglobin, role of 2,3-bisphosphoglycerate (BPG) in oxygen binding and delivery, biosynthesis of heme (iron containing porphyrin), its regulation, functions in the body, disorders of heme biosynthesis (various types of porphyria's), catabolism of heme, various types of jaundice

6.12 Describe the major types of hemoglobin and its derivatives found in the body and their physiological/ pathological relevance.	Types of normal human hemoglobin, types of normal & abnormal derivatives of hemoglobin, various hemoglobinopathies: Sickle cell anemia, Thalassemia

Competency No.	**Topics & Subtopics**
6.13 Describe the functions of the kidney, liver, thyroid and adrenal glands.	1. Functions of liver, disorders& liver function tests 2. Functions of kidney, disorders& kidney function tests 3.Functions of Thyroid, disorders& thyroid function tests 4.Functions of Adrenals , disorders& Adrenal function tests
6.14 Describe the tests that are commonly done in clinical practice to assess the functions of these organs (kidney, liver, thyroid and adrenal glands).	
6.15 Describe the abnormalities of kidney, liver, thyroid and adrenal glands.	
7	**Molecular Biology**
7.1 Describe the structure and functions of DNA and RNA and outline the cell cycle	Structure and functions of nucleotides, biologically important nucleotides and their importance, major types of synthetic analogs of nucleotides (antimetabolites) and their clinical significance, structure and functions of DNA and RNA, Phases of cell cycle

7.2 Describe the processes involved in replication & repair of DNA and the transcription & translation mechanisms.	Replication of DNA in Eukaryotes, inhibitors of DNA replication and different types of repair systems of DNA Transcription in Eukaryotes and posttranscriptional modifications, inhibitors, reverse transcription & its significance Genetic code and wobble hypothesis, Translation in Eukaryotes, inhibitors, chaperons , protein folding and posttranslational modifications
7.3	Causes and types of genetic mutations with examples. Regulation of Eukaryotic gene expression

Competency No.	**Topics & Subtopics**
Describe gene mutations and basic mechanism of regulation of gene expression **7.4** Describe applications of molecular technologies like Recombinant DNA technology, PCR in the diagnosis and treatment of diseases with genetic basis.	Recombinant DNA technology, restriction endonucleases, process of construction of recombinant DNA and its applications in medicine, DNA library, blot transfer techniques- southern blotting, northern blotting & western blotting, mechanism of polymerase chain reaction and its application in medical diagnosis and treatment of genetic diseases.
7.5 Describe the role of xenobiotics in disease	Mechanisms of biotransformation of xenobiotics & associated diseases.
7.6 Describe the anti-oxidant defense systems in the body.	Enzymatic and non-enzymatic antioxidant defense systems in the body.

7.7 Describe the role of oxidative stress in the pathogenesis of conditions such as cancer, complications of diabetes mellitus and atherosclerosis.	Free radical, biological sources of reactive oxygen species (ROS) and oxidative damage, oxidative stress, roll of oxidative stress in cancer, diabetes mellitus & atherosclerosis.
8	**Nutrition**
8.1 Discuss the importance of various dietary components and explain importance of dietary fiber.	Importance of carbohydrates, lipids, proteins & vitamins, quality of proteins, various types of dietary fibers and their importance in the diet.
8.2 Describe the types and causes of protein energy malnutrition and its effects.	Protein energy malnutrition, Kwashiorkor and Marasmus their causes and effects.

Competency No.	**Topics & Subtopics**
8.3 Provide dietary advice for optimal health in childhood and adult, in disease conditions like diabetes mellitus, coronary artery disease and in pregnancy.	Balanced diet in adult, in childhood and in pregnancy for optimal health, dietary advice in diabetes mellitus & coronary heart disease
8.4 Describe the causes (including dietary habits), effects and health risks associated with being overweight/ obesity	Causes, effects and health risk associated with overweight/ obesity

8.5 Summarize the nutritional importance of commonly used items of food including fruits and vegetables (macro-molecules & its importance)	Nutritional importance of commonly used items of food like cereals, pulses, eggs, meat, fish, fruits and vegetables and their normal dietary requirements.
9	**Extracellular Matrix**
9.1 List the functions and components of the extracellular matrix (ECM).	Types & functions of the extracellular matrix (ECM), Components and functions of proteoglycans, glycoproteins & major proteins of ECM
9.2 Discuss the involvement of ECM components in health and disease.	Disorders associated with components of ECM like Osteogenesis imperfecta, Marfan's Syndrome , Mucopolysaccharidoses, Scurvy & Menkes Disease
9.3 Describe protein targeting & sorting along with its associated disorders(It is non-core: N)	Types of protein targeting and sorting, disorders due to defects in mitochondrial targeting signals and defects in peroxisomal matrix protein import.
10	**Oncogenesis and Immunity**

Competency No.	**Topics & Subtopics**
10.1 Describe the cancer initiation, promotion oncogenes & oncogene activation. Also focus on p53 & apoptosis	Characteristics of cancer cell, molecular basis of cancer (carcinogenesis) ,various carcinogens and initiator, promoter of carcinogens, oncogenes and proto-oncogenes, tumor suppressor genes (retinoblastoma, RB and p53), mechanisms of apoptosis in physiologic and pathologic conditions .

10.2 Describe various biochemical tumor markers and the biochemical basis of cancer therapy.	Biochemical tumor markers, biochemical basis of chemotherapy, radiotherapy, hormonal therapy, targeted drug therapy and immunotherapy.
10.3 Describe the cellular and humoral components of the immune system & describe the types and structure of antibody	Cells of the Immune System, types of immune systems (Innate &adaptive), cellular and humoral components of innate and adaptive immune systems, B cell development and the formation of antibodies, types, structure and mechanism of action of antibodies (Immunoglobulins), primary and secondary response
10.4 Describe & discuss innate and adaptive immune responses, self/non-self-recognition and the central role of T-helper cells in immune responses	Innate and adaptive immune systems, immunological memory, T lymphocytes development, role of helper T cells (CD4+ T cells) and cytotoxic T cells/killer cells/CD8+ T cells in immune responses, Brief concept of MHC Disorders – Immunodeficiency, autoimmunity & hypersensitivity.
10.5 Describe antigens and concepts involved in vaccine development.	Antigens, concept involved in vaccine development and their types.
11	**Biochemical Laboratory Tests**
11.1 Describe commonly used laboratory apparatus and equipments, good safe laboratory practice and waste disposal.	Common lab equipments and apparatus like test tubes, pipettes & other glassware , auto pipettes, centrifuge, balances, oven, water bath good safe laboratory practice , management of needle stick injury & latest guidelines of disposal of biomedical waste

Competency No.	**Topics & Subtopics**

11.2 Describe the preparation of buffers and estimation of pH.	Preparation of buffer –acidic and alkaline. Measurement of pH paper and pH meter
11.3 Describe the chemical components of normal urine.	Chemical constituents of normal urine
11.4 & 11.20 **11.4:** Perform urine analysis to estimate and determine normal and abnormal constituents. **11.20:** Identify abnormal constituents in urine; interpret the findings and correlate these with pathological states.	Physical characteristics and organic constituents of urine. Collection of random & 24 hour urine sample Urine Report: Physical characteristics and abnormal constituents, urine dipsticks Interpretation of Urine Abnormalities
11.5 Describe screening of urine for inborn errors & describe the use of paper chromatography. Club Paper chromatography of amino acid & TLC from competency no 11.16	Urine: Screening of inborn errors. Paper chromatography for diagnosis of inborn errors
11.6 Describe the principles of colorimetry. (Club spectrophotometry from competency no **11.18**)	Colorimeter- Principle, Beer and Lambert's law & applications. Principles of spectrophotometry.
11.7,11.8, 11.21 & 11.22 **11.7-** Demonstrate the estimation of serum creatinine and creatinine clearance **11.8**- Demonstrate estimation of serum proteins, albumin and A:G ratio **11.21**- Demonstrate estimation of glucose, creatinine, urea and total protein in serum. **11.22**- Calculate albumin: globulin A:G ratio and creatinine clearance	Estimation of serum creatinine, urine creatinine and calculation of creatinine clearance and their clinical interpretation. Estimation of serum proteins, albumin and calculation of A/G ratio and their clinical interpretation. Estimation of plasma glucose, serum urea and their clinical interpretation.
11.9	Estimation of serum total cholesterol and HDL cholesterol, their ratio their clinical interpretation.

Competency No.	Topics & Subtopics
Demonstrate the estimation of serum total cholesterol and HDL cholesterol **11.10** Demonstrate the estimation of triglycerides	Estimation of serum triglycerides and their clinical interpretation.
11.11 Demonstrate estimation of calcium and phosphorous	Estimation of serum calcium and phosphorus their clinical interpretation.
11.12 Demonstrate the estimation of serum bilirubin	Estimation of serum bilirubin: Total, direct and indirect, their clinical interpretation.
11.13 & 2.2 **11.13-** Demonstrate the estimation of SGOT/ SGPT	Estimation of SGOT (AST)/ SGPT(ALT) and their clinical interpretation.
11.14 Demonstrate the estimation of alkaline phosphatase	Estimation of serum ALP and their clinical interpretation.
11.15 Describe & discuss the composition of CSF	Physical characteristics and chemical composition of CSF

11.16 & 11.19 **11.16-** Observe use of commonly used equipment's/techniques in biochemistry laboratory including: • pH meter • Paper chromatography of amino acid • Protein electrophoresis • TLC, PAGE • Electrolyte analysis by ISE • ABG analyzer • ELISA • Immunodiffusion • Autoanalyser • Quality control	Principle, application and working of following lab equipment's/techniques: pH meter, paper chromatography of amino acids, protein electrophoresis, TLC, PAGE, Electrolyte analysis by ISE, ABG analyzer, ELISA, immunodiffusion, auto analyzer, quality control, DNA isolation from blood/tissue (Paper chromatography of amino acid ,TLC clubbed with 11.5)

Competency No.	**Topics & Subtopics**
•DNA isolation from blood/ tissue **11.19** Outline the basic principles involved in the functioning of instruments commonly used in a biochemistry laboratory and their applications.	

11.17 Explain the basis and rationale of biochemical tests done in the following conditions: - diabetes mellitus, - dyslipidemia, - myocardial infarction, - renal failure, gout, - proteinuria, - nephrotic syndrome, - edema, - jaundice, - liver diseases, pancreatitis, disorders of acid- base balance, thyroid disorders.	Basis and rational of biochemical tests required in the following Conditions: - Diabetes mellitus-blood & urine glucose, microalbumin, ketone bodies and glycated hemoglobin – (Club with 3.8 & 3.10) - Dyslipidemia-lipid profile (Club with 4.5 & 4.7) - Myocardial infarction –CK, LDH, Troponin (Club with 2.6 & 2.7) - Renal failure & nephrotic syndrome, – BUN, Creatinine, urinary protein, cholesterol (Club with 3.8 & 3.10) - Gout- serum uric acid, synovial fluid analysis (Club with 6.3 & 6.4) - liver diseases & Jaundice- LFTs (Club with 6.1) Pancreatitis- serum amylase and lipase (Club with 2.5& 7 2.7) Disorder of acid base balance- ABG analysis for pH, pO_2, O_2 saturation pCO_2, HCO3 and base excess (BE) (Club with 6.7,6.8) - Thyroid disorder – serum free and total T3 & T4 and serum TSH (Club with 6.1)
11.18 Discuss the principles of spectrophotometry. **(Clubbed with 11.6)**	Spectrophotometer –principle & use
Competency No.	**Topics & Subtopics**

11.19 Outline the basic principles involved in the functioning of instruments commonly used in a Biochemistry laboratory and their applications. **(Clubbed with & 11.6 & 11.16)**	Instruments commonly used in Biochemistry laboratory & their applications.
11.20 Identify abnormal constituents in urine, interpret the findings and correlate these with pathological states. **(Clubbed with 11.4)**	
11.21 Demonstrate estimation of glucose, creatinine, urea and total protein in serum. **(Clubbed with 11.7, 11.8)**	
11.22 Calculate albumin: globulin (A/G)ratio and creatinine clearance **(Clubbed with 11.7, 11.8)**	
11.23 Calculate energy content of different food Items, identify food items with high and low glycemic index and explain the importance of these in the diet.	Energy contents of lipids, carbohydrates & proteins in common food items.
11.24 Enumerate advantages and/or disadvantages of use of unsaturated, saturated and trans fats in food.	Advantages of unsaturated fats, disadvantages of saturated and trans fats in food

Paper wise distribution of topics

Year: First MBBS Subject: Biochemistry

Paper	Section	Topics	Competency nos. BI
I	A	MCQs on all topics of the paper I	
	B & C	Basic Biochemistry	1.1
		Enzymes	2.1-2.7
		Chemistry & metabolism of carbohydrates	3.1-3.10
		Chemistry & metabolism of lipids	4.1-4.7
		Biological oxidation	6.6
		Xenobiotics	7.5
		Antioxidants &defence system	7.6-7.7
		Nutrition	8.1-8.5
		Extracellular matrix	9.1-9.3
		Oncology , oncogenesis & immunity	10.1-10.5
		Biomedical waste	11.1
		Physical characteristics and chemical composition of CSF	11.15
		Energy contents of lipids, carbohydrates & proteins in common food items, Advantages of unsaturated fats. Disadvantages of saturated and trans fats in food	11.23 & 11.24
		AETCOM- 1.4	
	For long answer question and scenario based / application questions, topics will not be repeated.		
II	A	MCQs on all topics of the paper II	
	B & C	Chemistry & metabolism of proteins	5.1-5.5
		Integration & starvation	6.1
		Nucleic acid metabolism	6.2-6.4

	Organ function test	6.13-6.15
	Molecular biology	7.1-7.3
	Genetic engineering	7.4
	Urine: Screening of inborn errors.	11.5
	Principle, application and working of following lab equipments/techniques: pH meter, paper chromatography of amino acids, protein electrophoresis, TLC, PAGE, Electrolyte analysis by ISE, ABG analyzer, ELISA, immunodiffusion, auto analyzer, quality control, DNA isolation from blood/tissue	11.16
For long answer question and scenario based / application questions, topics will not be repeated.		

Internal Assessment

Biochemisry

Applicable w.e.f August 2019 onwards examination for batches admitted from June 2019 onwards

S	I-Exam (December)			II-Exam (March)		
	Theory	Practical (Including 05 marks For Journals And Log Book)	Total Marks	Theory	Practical (Including 05 marks For Journals And Log Book)	Total Marks
1	100	50	150	100	50	150

	Preliminary Examinations				Remedial internal assessment examination for **Non - eligible** students		
	III-Exam **(July)**				**October**		
	Theory	Practical Including 10 Marks for Journal & Log Book	Total Marks		Theory	Practical Including 10 Marks for Journal & Log Book	Total Marks
	200	100	300		200	100	300

1. There will be 3 internal assessment examinations in the academic year. The structure of Preliminary examinations should be similar to the structure of University examination.
2. There will be only one additional examination for absent students (due to genuine reason) after approval by the Committee Constituted for the same. It should be taken after preliminary examination and before submission of internal assessment marks to the University.
3. First internal assessment examination will be held in December, second internal assessment examination will be held in March and third internal assessment examination will be held in July.
4. Internal assessment marks for theory and practical will be converted to out of 40. Internal assessment marks, after Conversion, should be submitted to university by 7th of August.
5. The student must secure at least 50% marks for total marks (combined in theory and practical / clinical: not less than 40% marks in theory and practical separately) assigned for internal assessment in a particular subject in order to be eligible for appearing at the final university examination of that subject. Internal assessment marks will reflect as separate head of passing at the summative examination.
6. **Remedial internal assessment examination for Non - eligible students**: Student who were not eligible due to less than 50% combined or less than 40% in any theory or practical, will re appear as repeater student for Prelim exam which will be conducted before Supplementary Exam. His/her internal assessment will be calculated on the basis of this Examination marks only. Students who will not be eligible in this Examination will appear with regular batch as repeater student.
7. The internal assessment marks of the remedial examination alone shall be considered and converted into out of 40.

8. Conversion **Formula for calculation of marks in internal assessment examinations**

	First IA	Second IA	Third IA (Prelim)	Total	Internal assessment marks: Conversion formula (out of 40)	Eligibility to appear for final University examination (after conversion out of 40) (40% Separately in Theory and Practical, 50% Combined)	
Theory	100	100	200	400	*Total marks obtained* / *10*	16 (minimum)	Total of Theory + Practical Must be 40.
Practical	50	50	100	200	*Total marks obtained* / *5*	16 (minimum)	

9. Conversion formula for calculation of marks in Remedial internal assessment examination

	Remedial Exam (Prelim)	Int. Assess. marks conversion formula (out of 40)	Eligibility to appear for Supplementary Exam. (after conversion out of 40) (40% Separately in Theory and Practical, 50% Combined)	
Theory	200	*Total marks obtained* / *5*	16 (minimum)	Total of Theory + Practical Must be 40.
Practical	100	*Total marks obtained* / *2.5*	16 (minimum)	

While preparing Final Marks of Internal Assessment, the rounding-off marks shall done as illustrated in following table

Internal Assessment Marks	**Final rounded marks**
15.01 to 15.49	15
15.50 to 15.99	16

First Year MBBS Practical Mark's Structure Internal Assessment Examinations I & II (Applicable for batch admitted in M.B.B.S Course from Academic Year 2019-20 & onwards)

Biochemistry						
Practical					Oral/Viva	Total
Seat No.	Quantitative Experiment	Quantitative Experiment/Urine organic/Urine Report/Quality Control/Interpolation of lab Report /Interpolation of Special Technique	Spots	Journal/ Logbook		
	A	B	C	D	E	F
Max. Marks	15	15	5	5	10	50

First Year MBBS Practical Marks Structure (Prelim)

(Applicable w.e.f August 2019 onwards examination for batches admitted from June 2019 onwards)

Biochemistry

Seat No	Case Based Quantitative Estimation	Urine Report/ Quantitative estimation	Quality Control	Interpretation of lab Reports & special techniques (Minimum 2 Interpretation)	Spots	Journal & Logbook	Practical Total	Viva Voce/ Oral	Practical/Viva Total Marks
	A	B	C	D	E	F	G	H	I
Max. Marks	25	15	10	20	10	10	90	10	100

(Please Note - The above examination pattern will be applicable to the students admitted from Academic Year 2019-20 and onwards, which is informed to all Medical Colleges vide University letter No MUHS /X-1 /UG /1692 /2020 Date: 28/02/2020)

First Year MBBS Practical Marks Structure (MUHS Exam)

(Applicable w.e.f August 2019 onwards examination for batches admitted from June 2019 onwards)

Biochemistry

Seat No	Case Based Quantitative Estimation	Urine Report/ Quantitative estimation	Quality Control	Interpretation of lab Reports & special techniques (Minimum 2 Interpretation)	Spots	Practical Total	Viva Voce/ Oral	Practical/Viva Total Marks
	A	B	C	D	E	F	G	H
Max. Marks	25	15	10	20	10	80	20	100

(Please Note - The above examination pattern will be applicable to the students admitted from Academic Year 2019-20 and onwards, which is informed to all Medical Colleges vide University letter No MUHS /X-1 /UG /1692 /2020 Date: 28/02/2020)

MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES, NASHIK

FORMAT / SKELETON OF QUESTION PAPER

1. Course and Year	:	**First MBBS** *(applicable w.e.f. Sept. 2020& onwards examinations)*				2. Subject Code	: ***Appendix - a***
3. Subject (PSP)	:	**Anatomy / Physiology / Biochemistry**					
(TT)	:						
4. Paper :	: ***I***	5. Total Marks	: **100**	6. Total Time	: **3 Hrs.**	7. Remu. (PS)	: **Rs. 300/-**
						8. Remu. (PM)	: **Rs. 350/-**
9. Web Pattern	: [ ]	10. Web Skeleton	: [ ]	11. Web Syllabus	: [ ]	12. Web Old QP	: [ ]

Instructions:

SECTION "A" MCQ

1) *Fill ● (dark) the appropriate empty circle below the question number once only.*
2) *Use **blue/black** ball point pen only.*
3) *Each Question carries **One mark.***
4) *A student will not be allotted any marks if he/she overwrites, strikes out or puts white ink on the circle once filled (darkened)*
5) *Do not write anything on the blank portion of the question paper if written anything, such type of act will be considered as an attempt to resort to unfair means.*

SECTION "A" MCQ (20 Marks)

Q1. Multiple Choice Questions (Total 20 MCQ of One mark each) ***(4 MCQ Should be clinical application based)*** (20x1=20)

a) b) c) d) e) f) g) h) i) j)

k) l) m) n) o) p) q) r) s) t)

SECTION "B"

Instructions: 1) *Use **blue/black** ball point pen only.*
2) ***Do not** write anything on the **blank portion of the question paper**. If written anything, such type of act will be considered as an attempt to resort to unfair means.*
3) ***All** questions are **compulsory**.*
4) *The number to the **right** indicates **full** marks.*
5) *Draw diagrams **wherever** necessary.*
6) *Distribution of syllabus in Question Paper is only meant to cover entire syllabus within the stipulated frame. The Question paper pattern is a mere guideline. Questions can be asked from any paper's syllabus into any question paper. Students cannot claim that the Question is out of syllabus. As It is only for the placement sake, the distribution has been done.*
7) *Use a common answerbook for all sections.*

SECTION "B" (80 Marks)

2. Brief answer questions (Any Ten out of Eleven) (10x 2= 20)

a) b) c) d) e) f) g) h) i) j) k)

3. Short Answer Questions (Any Eight out of Nine) (8x5= 40)

One SAQ has to be on AETCOM Module ***(For Anatomy 1.1, 1.5, For Physiology 1.2.,1.3&For Biochemistry, 1.4) &*** Minimum 2 SAQs should be Case Based Questions/ Clinically applied Questions.

a) b) c) d) e) f) g) h) i)

4. Long Answer Questions (Any Two out of Three) (2x 10= 20)

a) b) c)

Note: All questions should be structured .Wherever necessary; split up of marks should be specified.

MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES, NASHIK
FORMAT / SKELETON OF QUESTION PAPER

1.	Course and Year	:	**First MBBS** *(applicable w.e.f. Sept. 2020& onwards examinations)*					2. Subject Code	: ***Appendix - a***
3.	Subject (PSP)	:	**Anatomy / Physiology / Biochemistry**						
	(TT)	:							
4.	Paper :	:	***II***	5. Total Marks	: **100**	6. Total Time	: **3 Hrs.**	7. Remu. (PS)	: **Rs. 300/-**
								8. Remu. (PM)	: **Rs. 350/-**
9.	Web Pattern	: [ ]		10. Web Skeleton	: [ ]	11. Web Syllabus	: [ ]	12. Web Old QP	: [ ]

Instructions:

SECTION "A" MCQ

1) *Fill ● (dark) the appropriate empty circle below the question number once only.*
2) *Use **blue/black** ball point pen only.*
3) *Each Question carries **One mark.***
4) *A student will not be allotted any marks if he/she overwrites, strikes out or puts white ink on the circle once filled (darkened)*
5) *Do not write anything on the blank portion of the question paper if written anything, such type of act will be considered as an attempt to resort to unfair means.*

SECTION "A" MCQ (20 Marks)

1. Multiple Choice Questions (Total 20 MCQ of One mark each) ***(4 MCQ Should be clinical application based)*** (20x1=20)

a) b) c) d) e) f) g) h) i) j)

k) l) m) n) o) p) q) r) s) t)

SECTION "B"

Instructions: 1) *Use **blue/black** ball point pen only.*
2) ***Do not** write anything on the **blank portion of the question paper**. If written anything, such type of act will be considered as an attempt to resort to unfair means.*
3) ***All** questions are **compulsory**.*
4) *The number to the **right** indicates **full** marks.*
5) *Draw diagrams **wherever** necessary.*
6) *Distribution of syllabus in Question Paper is only meant to cover entire syllabus within the stipulated frame. The Question paper pattern is a mere guideline. Questions can be asked from any paper's syllabus into any question paper. Students cannot claim that the Question is out of syllabus. As It is only for the placement sake, the distribution has been done.*
7) *Use a common answer book for all sections.*

SECTION "B" (80 Marks)

2. Brief answer questions (Any Ten out of Eleven) (10x 2= 20)

a) b) c) d) e) f) g) h) i) j) k)

3. Short Answer Questions (Any Eight out of Nine) (8x5= 40)

Minimum 2 SAQs should be Case Based Questions/ Clinically applied Questions.

4. a) b) c) d) e) f) g) h) i) (2x 10= 20)

Long Answer Questions (Any Two out of Three)

a) b) c)

Note: All questions should be structured .Wherever necessary, split up of marks should be specified.

MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES, NASHIK

MARKLIST FOR PRACTICAL / ORAL / VIVA VOCE

(Summer / Winter – 20...Exam (MBBS UG Courses)

(Applicable for batch admitted in M.B.B.S Course from Academic Year 2019-20 & onwards)

Course : FIRST MBBS **Subject : Biochemistry**

CENTRE : **Marks : (Practical = Practical/Clinical + Viva) Min. 50 Max. 100**

Date : / /20 **Batch :**

Practical							Oral/Viva	Total
Seat No.	Case Based Quantitative Estimation	Urine Report/ Quantitative estimation	Quality Control	Interpretation of lab Report & special techniques (Minimum 2 interpretations)	Spots	Practical (Total)	Viva Voce/Oral Total	Practical/Viva Total Marks
	A	B	C	D	E	F	G	H
Max. Marks	25	15	10	20	10	80	20	100

Note : Both Examiners should jointly conduct practical examination for each student.

Verified above entries from Answerbooks and we hereby certify that the marks entered against each Seat Number are found correct.

NAME OF EXAMINER		COLLEGE	SIGNATURE WITH DATE	
1			Convenor	
2			Internal	
3			External	
4			External	

Biochemistry

BOOKS RECOMMENDED:

TEXT BOOKS:

1. Biochemistry by -Pankaja Naik
2. Biochemistry for Medical students by -D.M.Vasudevan & Shree Kumari S.
3. Medical Biochemistry - U.Satyanarayan.

REFERENCE BOOKS:

1. Integrated textbook of Biochemistry by- Indumati V and Sowbhagya Lakshmi.
2. Harper's Biochemistry.
3. Medical Biochemistry by -N.V.Bhagwan.
4. Biochemistry by- L.Stryer.

Course Content

Physiology **First M.B.B.S. (From August 2019)**

(Based on Medical Council of India, Competency based Undergraduate curriculum for the Indian Medical Graduate, 2018. Vol. 1; page no.91-118)

Teaching hours Lectures(hours)-160 Self directed learning (hours)-25

Small group teachings/tutorials/Integrated teaching/Practicals(hours)-310 Total(hours) -495 Early clinical exposure(hours)- 90 to be divided equally in all three subjects .

Competency No.	Topics & subtopics
1	**General Physiology**
PY. 1.1	Structure and Functions of a Mammalian Cell
PY. 1.2	Principles of Homeostasis
PY. 1.3	Intercellular communication
PY. 1.4	Apoptosis – Programmed cell death
PY. 1.5	Transport mechanisms across cell membranes
PY. 1.6	Fluid compartment of the body, its ionic composition & measurements
PY. 1.7	Concept of pH & Buffer systems in the body
PY. 1.8	Molecular basis of resting membrane potential and action potential in excitable tissue
PY. 1.9	Methods used to demonstrate the functions of the cells and its products, its communication and their applications in Clinical care and research.
2	**Topic: Hematology**
PY. 2.1	Composition & functions of blood components
PY. 2.2	Original, forms, variations and functions of plasma proteins
PY. 2.3	Synthesis and functions of Hemoglobin & explain its breakdown. Describe variants of hemoglobin

PY. 2.4	RBC formation (erythropoiesis & its regulation) and its functions
PY. 2.5	Types of anaemias & Jaundice
PY. 2.6	WBC formation (granulopoiesis) & its regulation
PY. 2.7	Formation of platelets, functions & variations
PY. 2.8	Physiological basis of hemostasis and anticoagulants. Describe bleeding & clotting disorders (Hemophilia, purpura)
PY. 2.9	Different blood groups and clinical importance of blood grouping, blood banking and transfusion
PY. 2.10	Types of immunity , development of immunity and its regulation
PY. 2.11	Estimation Hb, RBC, TLC, RBC indices, DLC, Blood group, BT/CT
PY. 2.12	Tests for ESR, Osmotic fragility, Hematocrit , findings and interpretion of test results etc.
PY. 2.13	Steps for reticulocyte and platelet count
3	**Nerve and Muscle Physiology**
PY. 3.1	Structure and functions of a neuron and neuroglia; Nerve Growth Factor & other growth factors/cytokines
PY. 3.2	Types, functions & properties of nerve fibers
PY. 3.3	Degeneration and regeneration in Peripheral nerves
PY. 3.4	Structure neuro-muscular junction and transmission of impulses
PY. 3.5	Action of neuro-muscular blocking agents
PY. 3.6	Pathophysiology of Myasthenia gravis
PY. 3.7	Types of muscle fibres and their structure
PY. 3.8	Action potential and its properties in different muscle types (skeletal & smooth)
PY. 3.9	Molecular basis of muscle contraction in skeletal and in smooth muscles

PY. 3.10	Mode of muscle contraction (isometric and isotonic)
PY. 3.11	Energy source and muscle metabolism
PY. 3.12	Gradation of muscular activity
PY. 3.13	Muscular dystrophy: myopathies
PY. 3.14	Ergography
PY. 3.15	Effect of mild, moderate and severe exercise and changes in cardiorespiratory parameters
PY. 3.16	Harvard Step test and impact on induced physiologic parameters in a simulated environment
PY. 3.17	Strength-duration curve
PY. 3.18	Computer assisted learning (i) amphibian nerve – muscle experiments (ii) amphibian cardiac experiments
4	**Gastro-intestinal Physiology**
PY. 4.1	Structure and functions of digestive system
PY. 4.2	Composition, mechanism of secretion, functions, and regulation of saliva, gastric, pancreatic, intestinal, juices and bile secretion
PY. 4.3	GIT movements, regulation and functions ,defecation reflex. Role of dietary fibre.
PY. 4.4	Physiology of digestion and absorption of nutrients
PY. 4.5	Source of GIT hormones, their regulation and functions
PY. 4.6	Gut-Brain Axis
PY. 4.7	Structure and functions of liver and gall bladder
PY. 4.8	Gastric function tests, pancreatic exocrine function test & liver function tests
PY. 4.9	Physiology aspects of; peptic ulcer, gastro- oesophageal reflux disease, vomiting, diarrhea , constipation, Adynamic ileus, Hirschsprung's disease
PY. 4.10	Clinical examination of the abdomen in a normal volunteer or simulated environment

5	**Cardiovascular Physiology (CVS)**
PY. 5.1	Functional anatomy of heart including chambers sounds; and Pacemaker tissue and conducing system.
PY. 5.2	Properties of cardiac muscle including its morphology, electrical, mechanical and metabolic functions
PY. 5.3	Events occurring during the cardiac cycle
PY. 5.4	Generation, conduction of cardiac impulse
PY. 5.5	Physiology of electrocardiogram (E.C.G.), its applications and the cardiac axis
PY. 5.6	Abnormal ECG, arrhythmias, heart block and myocardial infarction.
PY. 5.7	Haemodynamics of circulatory system
PY. 5.8	Local and systemic cardiovascular regulatory mechanisms
PY. 5.9	Factors affecting heart rate, regulation of cardiac output & blood pressure
PY. 5.10	Regional circulation including microcirculation, lymphatic, coronary, cerebral, capillary, Skin, foetal, pulmonary and splanchnic circulation
PY. 5.11	Patho-physiology of shock, syncope and heart failure
PY. 5.12	Blood pressure & pulse recording at rest and in different grades of exercise and postures in a volunteer or simulated environment
PY. 5.13	Record and interpret normal ECG in a volunteer or simulated environment
PY. 5.14	Cardiovascular autonomic function tests in a volunteer or simulated environment
PY. 5.15	Clinical examination of the cardiovascular system in a normal volunteer or simulated environment
PY. 5.16	Recording Arterial pulse tracing using finger plethysmography in a volunteer or simulated environment
6	**Respiratory Physiology**
PY. 6.1	Functional anatomy of respiratory tract

PY. 6.2	Mechanics of normal respiration, pressure changes during ventilation, lung volume and capacities, alveolar surface tension, compliance, airway resistance, ventilation, V/P ratio, diffusion capacity of lungs
PY. 6.3	Transport of respiratory gases: Oxygen and Carbon dioxide
	Regulation of respiration -- Neural & chemical
PY. 6.4	Physiology of high altitude deep sea diving
PY. 6.5	Principles of artificial respiration oxygen therapy, acclimatization and decompression sickness
PY. 6.6	Pathophysiology of dyspnea, hypoxia, cyanosis asphyxia; drowning, periodic breathing
PY. 6.7	Lung function tests & their clinical significance
PY. 6.8	Technique to perform & interpret Spirometry
PY. 6.9	Examination of the respiratory system in a normal volunteer or simulated environment
PY. 6.10	Technique to perform measurement of peak expiratory flow rate in a normal volunteer or simulated environment
7	**Renal Physiology**
PY. 7.1	Structure and function of kidney
PY. 7.2	Structure and functions of juxta glomerular apparatus and role of renin-angiotensin system
PY. 7.3	Mechanism of urine formation and processes involved
PY. 7.4	Significance & implication of Renal clearance
PY. 7.5	Renal regulation of fluid and electrolytes & acid-base balance
PY. 7.6	Innervations of urinary bladder, physiology of micturition and its abnormalities
PY. 7.7	Artificial kidney, dialysis and renal transplantation
PY. 7.8	Renal Function Tests
PY. 7.9	Cystometry and discuss the normal cystometrogram

8	**Endocrine Physiology**
PY. 8.1	Physiology of bone and calcium metabolism
PY. 8.2	Synthesis, secretion, transport, physiological actions, regulation and effects of altered (hypo and hyper) secretion of pituitary gland, thyroid gland, parathyroid gland, adrenal gland, pancreas and hypothalamus
PY. 8.3	Physiology of Thymus & Pineal Gland
PY. 8.4	Function tests: Thyroid gland; Adrenal cortex, Adrenal medulla and pancreas
PY. 8.5	Metabolic and endocrine consequences of obesity & metabolic syndrome, Stress response. Outline the psychiatry component pertaining to metabolic syndrome
PY. 8.6	Mechanism of action of steroid, protein and amine hormones
9	**Reproductive Physiology**
PY. 9.1	Sex determination; sex differentiation and their abnormalities and outline psychiatry and practical implementation of sex determination
PY. 9.2	Puberty: onset, progression, states; early and delayed puberty and outline adolescent clinical and psychological association
PY. 9.3	Male reproductive system: functions of testis and control of spermatogenesis & factors modifying it and outline its association with psychiatric illness
PY. 9.4	Female reproductive system: (a) functions of ovary and its control; (b) menstrual cycle – hormonal, uterine and ovarian changes
PY. 9.5	Physiological effects of sex hormones
PY. 9.6	Contraceptive methods for male and female. Discuss their advantages & disadvantages
PY. 9.7	Effects of removal of gonads on physiological functions
PY. 9.8	Physiology of pregnancy, parturition & lactation and outline the psychology and psychiatry-disorders associated with it

PY. 9.9	Interpret a normal semen analysis report including (a) sperm court, (b) sperm morphology and (c) sperm motility, as per WHO guidelines and discuss the result
PY. 9.10	Physiological basis of various pregnancy tests
PY. 9.11	Hormonal changes and their effects during perimenopause and menopause
PY. 9.12	Common causes of infertility in a couple and role of IVF in managing a case of infertility
10	**Neurophysiology**
PY. 10.1	Organization of nervous system
PY. 10.2	Functions and properties of synapse, reflex, receptors
PY. 10.3	Somatic sensations & sensory tracts
PY. 10.4	Motor tracts, mechanism of maintenance of tone, control of body movements, posture and equilibrium & vestibular apparatus
PY. 10.5	Structure and functions of reticular activating system, autonomic nervous system (ANS)
PY. 10.6	Spinal cord, its functions, lesion & sensory disturbances
PY. 10.7	Functions of cerebral cortex, basal ganglia thalamus, hypothalamus. Cerebellum and limbic system and their abnormalities
PY. 10.8	Behavioural and EEG characteristics during sleep and mechanism responsible for its production
PY. 10.9	Physiological basis of memory, learning and speech
PY. 10.10	Chemical transmission in the nervous system. (Outline the psychiatry element)
PY. 10.11	Clinical examination of the nervous system: Higher functions, sensory system, motor system, reflexes, cranial nerves in a normal volunteer or simulated environment
PY. 10.12	Normal EEG forms
PY. 10.13	Perception of smell and taste sensation

PY. 10.14	Patho-physiology of altered smell and taste sensation
PY. 10.15	Functional anatomy of ear and auditory pathways & physiology of hearing
PY. 10.16	Pathophysiology of deafness. Hearing tests
PY. 10.17	Functional anatomy of eye, physiology of image formation, physiology of vision including colour vision, refractive errors, colour blindness, physiology of pupil and light reflex
PY. 10.18	Physiological basis of lesion in visual pathway
PY. 10.19	Auditory & visual evoke potentials
PY. 10.20	(i) Testing of visual acuity, colour and field of vision and (ii) hearing (iii) Testing for smell and (iv) taste sensation in volunteer/ simulated environment
11	**Integrated Physiology**
PY. 11.1	Mechanism of temperature regulation
PY. 11.2	Adaptation to altered temperature (heat and cold)
PY. 11.3	Mechanism of fever, cold injuries and heat stroke
PY. 11.4	Cardio-respiratory and metabolic adjustment during exercise; physical training effects
PY. 11.5	Physiological consequences of sedentary lifestyle
PY. 11.6	Physiology of Infancy
PY. 11.7	Physiology of aging; free radicals and antioxidants
PY. 11.8	Cardio-respiratory changes in exercise (isometric and isotonic) with that in the resting state and under different environmental conditions (heat and cold)
PY. 11.9	Interpretation of growth charts
PY. 11.10	Interpretation of anthropometric assessment of infants
PY. 11.11	Concept, criteria for diagnosis of Brain death and its implications
PY. 11.12	Physiological effects of meditation

PY. 11.13	History taking and general examination in the volunteer / simulated environment
PY. 11.14	Basic Life Support in a simulated environment

Paper wise distribution of topics

Year: First MBBS Subject: Physiology

Paper	Section	Topics
I	A	MCQs on all topics of the paper I
	B & C	General Physiology
		Blood
		Respiratory System
		Cardio Vascular System,
		Cardio-respiratory and metabolic adjustment during exercise
		Renal system
		Gastro intestinal system
		Life style, aging, Meditation
		AETCOM module no. 1.2 & 1.3
		Scenario based / application questions can be on any topic of the paper I
		For long answer question and scenario based / application questions , topics will not be repeated
II	A	MCQs on all topics of the paper II
	B & C	Endocrine Physiology
		Reproductive System, Physiology of Infancy
		Special senses
		Central nervous system including brain death Temperature Regulation & applied
		Nerve muscle physiology
		Scenario based / application questions can be on any topic of the paper II
		For long answer question and scenario based / application questions , topics will not be repeated

Internal Assessment

Physiology

Applicable w.e.f August 2019 onwards examination for batches admitted from June 2019 onwards

Sr. No	I-Exam (December)			II-Exam (March)		
	Theory	Practical (Including 05 Marks for Journal & Log Book)	Total Marks	Theory	Practical Including 05 Marks for Journal & Log Book	Total Marks
1	100	50	150	100	50	150

Sr. No	Preliminary Examinations			Sr. No	Remedial internal assessment examination for **Non - eligible** students		
	III-Exam **(July)**				**October**		
	Theory	Practical Including 10 Marks for Journal & Log Book	Total Marks		Theory	Practical Including 10 Marks for Journal & Log Book	Total Marks
1	200	100	300	1	200	100	300

1. There will be 3 internal assessment examinations in the academic year. The structure of Preliminary examinations should be similar to the structure of University examination.

2. There will be only one additional examination for absent students (due to genuine reason) after approval by the Committee Constituted for the same. It should be taken after preliminary examination and before submission of internal assessment marks to the University.

3. First internal assessment examination will be held in December, second internal assessment examination will be held in March and third internal assessment examination will be held in July.

4. Internal assessment marks for theory and practical will be converted to out of 40. Internal assessment marks, after Conversion, should be submitted to university by 7th of August.

5. The student must secure at least 50% marks for total marks (combined in theory and practical / clinical: not less than 40% marks in theory and practical separately) assigned for internal assessment in a particular subject in order to be eligible for appearing at the final university examination of that subject. Internal assessment marks will reflect as separate head of passing at the summative examination.

6. **Remedial internal assessment examination for Non - eligible students**: Student who were not eligible due to less than 50% combined or less than 40% in any theory or practical, will re appear as repeater student for Prelim exam which will be conducted before Supplementary Exam. His/her internal assessment will be calculated on the basis of this Examination marks only. Students who will not be eligible in this Examination will appear with regular batch as repeater student.

7. The internal assessment marks of the remedial examination alone shall be considered and converted into out of 40.

8. Conversion **Formula for calculation of marks in internal assessment examinations**

	First IA	Second IA	Third IA (Prelim)	Total	Internal assessment marks: Conversion formula (out of 40)	Eligibility to appear for final University examination (after conversion out of 40) (40% Separately in Theory and Practical, 50% Combined)	
Theory	100	100	200	400	$\frac{\text{Total marks obtained}}{10}$	16 (minimum)	Total of Theory + Practical Must be 40.
Practical	50	50	100	200	$\frac{\text{Total marks obtained}}{5}$	16 (minimum)	

9. Conversion formula for calculation of marks in Remedial internal assessment examination

	Remedial Exam (Prelim)	Int. Assess. marks conversion formula (out of 40)	Eligibility to appear for Supplementary Exam. (after conversion out of 40) (40% Separately in Theory and Practical, 50% Combined)	
Theory	200	$\frac{\text{Total marks obtained}}{5}$	16 (minimum)	Total of Theory + Practical Must be 40.
Practical	100	$\frac{\text{Total marks obtained}}{2.5}$	16 (minimum)	

While preparing Final Marks of Internal Assessment, the rounding-off marks shall done as illustrated in following table

Internal Assessment Marks	**Final rounded marks**
15.01 to 15.49	15
15.50 to 15.99	16

First Year MBBS Practical Mark's Structure Internal Assessment Examinations I & II (Applicable for batch admitted in M.B.B.S Course from Academic Year 2019-20 & onwards)

Physiology

	Hematology	Clinical Examination/Human Physiology expt. / Short exercises	Journal/ Logbook	Oral Viva	Total
	A	B	C	D	E
Max. Marks	15	20	5	10	50

First Year MBBS Physiology Practical Mark's Structure (Prelim exam)

(Applicable w.e.f August 2019 onwards examination for batches admitted from June 2019 onwards)

Seat No.	Exercise 1				Exercise 2	Exercise 3 *	Exercise 4**		Practical (Total)	Oral/Viva (Total)	PR/Oral Total
	Clinical Examination										
	C.V.S	R.S	C.N.S. & Special Senses	General Exam & Abdomen	Hematology	Short exercise	Human Physiology Experiment	Journal & Log book			
	A	B	C	D	E	F	G	H	I	J	K
Max. Mark's	10.0	10.0	10.0	10.0	10.0	15.0	15.0	10.0	90	10.0	100

***Short exercises 3 marks each(3X5)**

1. Case based scenarios/ endocrine disorders photographs .2. Interpretation of function tests. 3. One skeletal graph

4. One cardiac graph 5. Calculation

**** Exercise 4: Human Physiology Experiment** 1. Basic Life Support in a simulated environment 2. ECG 3. Spirometry 4. PEFR 5. EEG Interpretation 6. Ergography 7. Harward step test 8. Perimetry

*** Suggested Methods of Assessment**

Preclinical exam & OSPE

(Please Note - The above examination pattern will be applicable to the students admitted from Academic Year 2019-20 and onwards, which is informed to all Medical Colleges vide University letter No MUHS /X-1 /UG /1692 /2020 Date: 28/02/2020)

First Year MBBS Physiology Practical Mark's Structure(MUHS)

(Applicable w.e.f August 2019 onwards examination for batches admitted from June 2019 onwards)

	Exercise 1				Exercise 2	Exercise 3 *	Exercise 4**	Practical (Total)	Oral/Viva (Total)	PR/Oral Total
	Clinical Examination									
	C.V.S	R.S	C.N.S. & Special Senses	General Exam & Abdomen	Hematology	Short exercises	Human Physiology Experiment			
	A	B	C	D	E	F	G	H	I	J
Max. Mark's	10.0	10.0	10.0	10.0	10.0	15.0	15.0	80	20.0	100

***Short exercises 3 marks each(3X5)**

1. Case based scenarios/ endocrine disorders photographs .2. Interpretation of function tests. 3. One skeletal graph

4. One cardiac graph 5. Calculation

**** Exercise 4: Human Physiology Experiment** 1. Basic Life Support in a simulated environment 2. ECG 3. Spirometry 4. PEFR 5. EEG Interpretation 6. Ergography 7. Harward step test 8. Perimetry

*** Suggested Methods of Assessment**

Clinical exam & OSPE

(Please Note - The above examination pattern will be applicable to the students admitted from Academic Year 2019-20 and onwards, which is informed to all Medical Colleges vide University letter No MUHS /X-1 /UG /1692 /2020 Date: 28/02/2020)

MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES, NASHIK

FORMAT / SKELETON OF QUESTION PAPER

1. Course and Year	:	**First MBBS** *(applicable w.e.f. Sept. 2020& onwards examinations)*						2. Subject Code	:	***Appendix - a***	
3. Subject (PSP)	:	**Anatomy / Physiology / Biochemistry**									
(TT)	:										
4. Paper :	:	***I***	5. Total Marks	:	**100**	6. Total Time	:	**3 Hrs.**	7. Remu. (PS)	:	**Rs. 300/-**
									8. Remu. (PM)	:	**Rs. 350/-**
9. Web Pattern	:	[ ]	10. Web Skeleton	:	[ ]	11. Web Syllabus	:	[ ]	12. Web Old QP	:	[ ]

Instructions:

SECTION "A" MCQ

1) *Fill ⬬ (dark) the appropriate empty circle below the question number once only.*
2) *Use **blue/black** ball point pen only.*
3) *Each Question carries **One mark.***
4) *A student will not be allotted any marks if he/she overwrites, strikes out or puts white ink on the circle once filled (darkened)*
5) *Do not write anything on the blank portion of the question paper if written anything, such type of act will be considered as an attempt to resort to unfair means.*

SECTION "A" MCQ (20 Marks)

Q1. Multiple Choice Questions (Total 20 MCQ of One mark each) ***(4 MCQ Should be clinical application based)*** (20x1=20)

a) b) c) d) e) f) g) h) i) j)

k) l) m) n) o) p) q) r) s) t)

SECTION "B"

Instructions:

1) *Use **blue/black** ball point pen only.*
2) ***Do not** write anything on the **blank portion of the question paper**. If written anything, such type of act will be considered as an attempt to resort to unfair means.*
3) ***All** questions are **compulsory**.*
4) *The number to the **right** indicates **full** marks.*
5) *Draw diagrams **wherever** necessary.*
6) *Distribution of syllabus in Question Paper is only meant to cover entire syllabus within the stipulated frame. The Question paper pattern is a mere guideline. Questions can be asked from any paper's syllabus into any question paper. Students cannot claim that the Question is out of syllabus. As It is only for the placement sake, the distribution has been done.*
7) *Use a common answerbook for all sections.*

SECTION "B" (80 Marks)

2. Brief answer questions (Any Ten out of Eleven) (10x 2= 20)

a) b) c) d) e) f) g) h) i) j) k)

3. Short Answer Questions (Any Eight out of Nine) (8x5= 40)

One SAQ has to be on AETCOM Module ***(For Anatomy 1.1, 1.5, For Physiology 1.2.,1.3&For Biochemistry, 1.4) &***
Minimum 2 SAQs should be Case Based Questions/ Clinically applied Questions.

a) b) c) d) e) f) g) h) i)

4. Long Answer Questions (Any Two out of Three) (2x 10= 20)

a) b) c)

Note: All questions should be structured .Wherever necessary; split up of marks should be specified.

MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES, NASHIK
FORMAT / SKELETON OF QUESTION PAPER

1. Course and Year	:	**First MBBS** *(applicable w.e.f. Sept. 2020& onwards examinations)*							2. Subject Code	:	***Appendix - a***
3. Subject (PSP)	:	**Anatomy / Physiology / Biochemistry**									
(TT)	:										
4. Paper :	:	***II***	5. Total Marks	:	**100**	6. Total Time	:	**3 Hrs.**	7. Remu. (PS)	:	**Rs. 300/-**
									8. Remu. (PM)	:	**Rs. 350/-**
9. Web Pattern	: [ ]		10. Web Skeleton	: [ ]		11. Web Syllabus	: [ ]		12. Web Old QP	: [ ]	

Instructions:

SECTION "A" MCQ

1) *Fill ● (dark) the appropriate empty circle below the question number once only.*
2) *Use **blue/black** ball point pen only.*
3) *Each Question carries **One mark.***
4) *A student will not be allotted any marks if he/she overwrites, strikes out or puts white ink on the circle once filled (darkened)*
5) *Do not write anything on the blank portion of the question paper if written anything, such type of act will be considered as an attempt to resort to unfair means.*

SECTION "A" MCQ (20 Marks)

1. Multiple Choice Questions (Total 20 MCQ of One mark each) ***(4 MCQ Should be clinical application based)*** (20x1=20)

a) b) c) d) e) f) g) h) i) j)

k) l) m) n) o) p) q) r) s) t)

SECTION "B"

Instructions:

1) *Use **blue/black** ball point pen only.*
2) ***Do not** write anything on the **blank portion of the question paper**. If written anything, such type of act will be considered as an attempt to resort to unfair means.*
3) ***All** questions are **compulsory**.*
4) *The number to the **right** indicates **full** marks.*
5) *Draw diagrams **wherever** necessary.*
6) *Distribution of syllabus in Question Paper is only meant to cover entire syllabus within the stipulated frame. The Question paper pattern is a mere guideline. Questions can be asked from any paper's syllabus into any question paper. Students cannot claim that the Question is out of syllabus. As It is only for the placement sake, the distribution has been done.*
7) *Use a common answer book for all sections.*

SECTION "B" (80 Marks)

2. Brief answer questions (Any Ten out of Eleven) (10x 2= 20)

a) b) c) d) e) f) g) h) i) j) k)

3. Short Answer Questions (Any Eight out of Nine) (8x5= 40)

Minimum 2 SAQs should be Case Based Questions/ Clinically applied Questions.

4. a) b) c) d) e) f) g) h) i) (2x 10= 20)

Long Answer Questions (Any Two out of Three)

ı) b) c)

Note: All questions should be structured .Wherever necessary, split up of marks should be specified.

MARKLIST FOR PRACTICAL / ORAL / VIVA VOCE

(Summer / Winter – 20...Exam (MBBS UG Courses)

(Applicable for batch admitted in M.B.B.S Course from Academic Year 2019-20 & onwards)

Course : FIRST MBBS **Subject : Physiology**

CENTRE : **Marks : (Practical = Practical/Clinical + Viva) Min. 50 Max. 100**

Date : / /20 **Batch :**

Practical									Oral/Viva	Total
Seat No.	C.V.C	R.S	C.N.S. & Special senses	Abdomen	Exercise (2) Hematology	Exercise (3) Short Exercise	Human Physiology Experiment	Practical (Total)	Oral/Viva Total	PR/Oral Total
	A	B	C	D	E	F	G	H	I	J
Max. Marks	10	10	10	10	10	15	15	80	20	100

Note : Both Examiners should jointly conduct practical examination for each student.

Verified above entries from Answerbooks and we hereby certify that the marks entered against each Seat Number are found correct.

	NAME OF EXAMINER	COLLEGE	SIGNATURE WITH DATE	
1			Convener	
2			Internal	
3			External	
4			External	

Books recommended:

1) Textbooks of Physiology :

Guyton - Textbook of Physiology Ganong -
Review of Medical Physiology
S. Wright - Applied Physiology

2) Reference Books :

Best and Taylor - Physiological basis of medical practice
Berne & levy. - Principles of Physiology
Dr. V.G. Ranade - Laboratory Manual and Journal of Physiology Practicals
Ghai's VP Varshney, Mona Bedi- Textbook of Physiology -9 th Edition2019.
G.K. Pal-Comprehensive Text Book of Medical Physiology.
Dr.Amarnath B. Solepure - Fundamental Human Neurophysiology-First Edition 2018.

Course Content

(Based on Medical Council of India, Competency based Undergraduate curriculum for the Indian Medical Graduate, 2018. Vol. 2 ; page no.41-59)

Applicable for batch admitted in M.B.B.S Course from Academic Year 2019-20 & onwards

Subject: Community Medicine **Year: First MBBS**

Competency No. CM	Topics & subtopics
	Health care of the communtiy
17.1	Health care to community
	Visit to primary/secondary health facility
	Role of physician in health care delivery- Integration with AETCOM module 1.1 What does it mean to be doctor?
17.2	Community diagnosis
17.3	Primary Health Care- Def, Principles
17.4	National Health Policies , MDGs
	SDL- Current national / stale level status of health indicators
17.5	Health Care delivery in India
	Nutrition
5.1	Common sources of various nutrients

	Demonstration: Foods we eat & their nutritive values
	Special nutritional requirements according to age, sex, activity, physiological conditions
	SDL- Foods customs in our families for special groups such as children/ pregnant/lactating women/ill persons (data collection by interviewing 5 homemakers)
5.2	Nutritional assessment at individual level- DOAP
	Nutritional assessment at family and community level -DOAP
5.3	Common nutritional deficiency diseases- Epidemiology , prevention and control
5.4	Diet planning at individual level
	Diet planning at family level
5.5	Nutritional surveillance and rehabilitation
	Visit to Nutritional rehabilitation centre
	Nutrition education
5.6	National Nutritional Policy , National Nutritional Programs
5.7	Food hygiene , food adulteration
	Demonstration of simple tests to identify food adulteration
5.8	Food fortification , food additives
	Concept of Health and Disease
1.1	Concept of Public Health
1.2	Concept , definition , determinants of health
	Determinants of health- Group discussion
1.3	Epidemiological triad , multifactorial causation of disease
	SDL-Identification of multiple causative factors of 2 common diseases(interview in wards/ family visit)

1.4	Natural history of disease
1.5	Levels of Prevention
1.6	Health education , IEC, BCC
1.7	Indicators of health
	Exercise on calculation of indicators
1.8	Demographic profile of India
	Exercise on calculation of demographic indicators , fertility rates
	SDL- Demographic trends in India
1.9	Communication skills in Health
	DOAP-Verbal/non verbal communication
	Empathy- What does it mean to be patient? AETCOM module 1.2
1.10	Doctor patient relationship
	SDL- Determinants of doctor patient relationship(Collection of data from patients/ relatives)
	Case discussions – Integration with AETCOM module 1.3
	Principles of health promotion and education
4.1	Methods of health education
	Demonstration of various methods of health education
	Improving communication, barriers in communication- integration with AETCOM module 1.4
4.2	Organization of health educational and counselling activities for individual & family
	Organization of counselling activity in ward/OPDs
	Organization of community based health educational activity(community/school)

4.3	Evaluation of health education & promotion program
	SDL- Preparation of tool for evaluation
	Conducting evaluation of health education & promotion program

Note:

1. **The observations/ reflections of family / hospital visits , DOAP sessions , Self directed learning activities (SDL) , practicals should be entered in the log book immediately after the assignment.**
2. **The observer / facilitator / teacher will provide the written brief feedback in the log book for the learner related to the competencies.**

Course Content
Second Professional (from October 2020)
Subject: Community Medicine Theory / Practical

(Based on Medical Council of India, Competency based Undergraduate curriculum for the Indian Medical Graduate, 2018. Vol. 2; page nos. 41-59)

1. Total Teaching hours :60
2. **A**. Lectures(hours): 20 **B**. Self-directed learning (hours) :10

C. Clinical Postings (hours): 4 weeks (20 working days x 3)- 60 hours

D. Small group teachings/tutorials/Integrated teaching/Practicals (hours)**:** 30

Competency Nos.	**Topics Subtopics**
	Environmental Health Problems
CM3.1	Indicators of air pollution. Health hazards of air, water, noise, radiation and pollution. Prevention and control of environmental pollution.
CM3.2	Safe and wholesome water, sanitary sources of water, water purification processes, water quality standards, concepts of water conservation and rainwater harvesting
CM3.3	Epidemilogy , prevention and control of water borne diseases /jaundice/hepatitis/ diarrheal diseases
CM3.4	Solid waste, human excreta , sullage and sewage disposal
CM3.5	Standards of housing and the effect of housing on health
CM3.6	Role of vectors in the causation of diseases. National Vector Borne Disease Control Program
CM3.7	Identifying features and life cycles of vectors of Public Health importance and their control measures
CM3.8	Mode of action, application cycle of commonly used insecticides and rodenticides
	Epidemiology of communicable diseases
CM 7.2	Modes of transmission and measures for prevention and control of communicable
CM8.1	**Epidemiological and control measures including the use of essential laboratory tests at the primary care level for communicable diseases**
	Epidemiological characteristics and control measures including the use of essential laboratory tests at the primary care level for Airborne infections &Exanthematous fevers e.g TB, Influenza, ARI, Measles,Mumps,Diptheria,Pertusis.
	Epidemiological characteristics and control measures including the use of essential laboratory tests at the primary care level for Faeco-oral diseases, Infective hepatitis e.g polio, AGE, Typhoid etc.
	Epidemiological characteristics and control measures including the use of essential laboratory tests at the

Competency Nos.	Topics Subtopics
	primary care level for zoonotic diseases e.g Rabies, Plague, Brucellosis, Leptospirosis etc
	Epidemiological characteristics and control measures including the use of essential laboratory tests at the primary care level for Arthropod borne diseases eg Malaria, Chikungunya, Filaria, JE etc
	Epidemiological characteristics and control measures including the use of essential laboratory tests at the primary care level for Surface infections and STDs eg HIV, Syphilis, Gonorrhea etc
	Epidemiological characteristics and control measures including the use of essential laboratory tests at the primary care level for Emerging and reemerging diseases eg Ebola virus disease, Nipah
CM8.2	Epidemiological characteristics and control measures including the use of essential laboratory tests at the primary care level for Non Communicable diseases (diabetes, Hypertension, Stroke, obesity and cancer etc.)
CM8.3	Disease specific National Health Programs including their prevention and treatment of a case
CM8.4	Principles and measures to control a disease epidemic
CM 7.7	Steps in the Investigation of an epidemic of communicable disease and the principles of control measures
CM8.5	Principles of planning, implementing and evaluating control measures for disease at community level bearing in mind the public health importance of the disease
CM8.6	Training of health workers in disease surveillance, control & treatment and health education
	Disaster Management
CM13.1	Concept of Disaster management
CM13.2	Disaster management cycle
CM13.3	Man made disasters in the world and in India
CM13.4	National Disaster management Authority
	Hospital waste management
CM14.1	Hospital waste- definition and classification
CM14.3	Laws related to hospital waste management
	Essential Medicine
CM19.1	Essential Medicine List (EML)
CM19.2	Essential medicine in primary health care
CM19.3	Counterfeit medicine and its prevention

Competency Nos.	Topics Subtopics
	Relationship of social and behavioural to health and disease
CM2.1	Clinico socio-cultural and demographic assessment of the individual, family and community
CM2.2	Socio-cultural factors, family (types), its role in health and disease & assessment of socio-economic status
CM2.3	Factors affecting health seeking behaviour and assessment of barriers for the same.
CM2.4	Social psychology, community behaviour and community relationship and their impact on health and disease
CM2.5	Indicators for assessment of poverty , social security measures and its relationship to health and d isease

Second Professional - Community Medicine : Proposed List of Practicals / DOAP/ SDL Activities

Competency no.	Practical / DOAP
CM3.2	Visit to water purification plant
	Visit to Dist Public Health Laboratory
	Exercise on interpretation of water analysis report
	DOAP- water collection , estimation of chlorine demand/ residual chlorine content of drinking water , OT test
CM 3.2-3.4SDL	Preparation of Proforma/ checklist for sanitary survey of the community
3.4	Visit to sewage purification plant
3.6	Visit to office of Dist Vector borne Diseases Control Program
3.7	Demonstration: Identifying characteristics of vectors of Public Health Importance – DOAP
SDL	Preparation of Proforma/ checklist for entomological survey of the community
8.1	Visits to the Dist Offices/ Units/ clinics related to implementation of Disease Control Measures of Communicable Diseases

8.1	Visit to Public Health Microbiology / Reference laboratories
8.1	DOAP- Methods of Specimen collection and transportation of various body specimens in various communicable diseases
CM 7.7	Describe and demonstrate the steps in the Investigation of an epidemic of communicable disease and describe the principles of control measures
8.4	DOAP- Analysis & interpretation of disease outbreak data
8.4	DOAP- Preparation of epidemic curve / spot map with the help of given data and its interpretation
8.6	Visit to Dist Training Centre / Dist Disease Surveillance Unit
13.2	DOAP- Preparation of Disaster Preparedness Plan for a Primary Health Centre
13.4	Visit to Civil Defence Dept / Dist Disaster Management Office
14.1 SDL	Conducting Survey of Hospital Wastes Segregation Practices
14.1	DOAP- Hospital waste segregation of various types of hospital wastes
19.2	Visit to hospital pharmacy

Second Professional - Proposed Activities in First Clinical Community Medicine Posting (4 weeks)

Week	Proposed Activities
First and second week	a. Clinico socio-cultural and demographic assessment of the individuals and allotted families, b. Sanitary survey of the allotted households c. Assessment of housing conditions in allotted families d. Entomological survey of the allotted households e. Analysis of survey findings of the allotted families and group discussion on important health related issues in the community. f. Organization of health educational activity for the allotted families and allotted community.
Third and fourth week	Epidemiological history taking of common communicable diseases admitted in hospital such as diarrhoeal diseases , jaundice , typhoid , food poisoning , measles , mumps , influenza, diphtheria , pertussis , tuberculosis, malaria, filarial , dengue fever , HIV / AIDS, STDs etc

Note:

1. **The observations/ reflections of family / hospital / community visits, DOAP sessions, Self directed learning activities (SDL), practicals should be entered in the log book immediately after the assignment.**
2. **The observer / facilitator / teacher will provide the written brief feedback in the log book for the learner related to the competencies.**

Course Content

Third Professional Part I (from October 2020)

Subject :Community Medicine Theory / Practical

(Based on Medical Council of India, Competency based Undergraduate curriculum for the Indian Medical Graduate, 2018. Vol. 2 ; page nos. 41-59)

1. Total Teaching hours : 105
2. **A**. Lectures(hours): 40 **B.** Self directed learning (hours) :5

C. Clinical Postings(hours): 6 weeks(30 working days x 3)- 90 hours

D. Small group teachings/tutorials/Integrated teaching/Practicals(hours)**:** 60

Competency Nos.	**Topics & Subtopics**
	Epidemiology
CM 7.1	Epidemiology- definition , principles, concepts and uses
CM 7.3	Sources of epidemiological data
CM 7.4	Morbidity and mortality indicators
CM 7.5	Epidemiological study designs
CM 7.6	Screening
CM 7.8	Principles of association, causation and biases in epidemiological studies
CM 7.9	Application of computers in epidemiology
	Basic statistics and its applications
CM6.1	Concepts of research problem ,Research question , research hypothesis for a study
CM6.2 **SGT**	Methods of collection, classification, analysis, interpretation and presentation of statistical data
CM6.3	Application of elementary statistical methods including test of significance in various study designs
CM6.4	Common sampling techniques, simple statistical methods, frequency distribution, measures of central tendency and dispersion

Competency Nos.	Topics & Subtopics
	Epidemiology of non- communicable diseases
CM8.2	Epidemiological and control measures including the use of essential laboratory tests at the primary care level for Non Communicable diseases (diabetes, Hypertension, Stroke, obesity and cancer etc.)
CM8.3	National Health Programs
CM8.5	Principles of planning, implementing and evaluating control measures for disease at community level bearing in mind the public health importance of the disease
CM8.6	Education and training of health workers in disease surveillance, control & treatment and health education
CM8.7	Principles of management of information systems
	Demography and vital statistics
CM9.1	Principles of Demography, Demographic cycle, Vital statistics
CM9.2	Demographic indices including birth rate, death rate, fertility rates
CM9.3	Causes of declining sex ratio and its social and health implications
CM9.4	Causes and consequences of population explosion and population dynamics of India.
CM9.5	Methods of population control
CM9.6	National Population Policy
CM9.7	Sources of vital statistics including census, SRS, NFHS, NSSO etc
	Reproductive maternal and child health
CM10.1	Current status of Reproductive, maternal, newborn and Child Health
CM10.2	Methods of screening high risk groups and common health problems
	Population Genetics: Screening and counselling for genetic conditions
CM10.3	Local customs and practices during pregnancy, childbirth, lactation and child feeding practices
CM10.4	Reproductive, maternal, newborn & child health (RMCH); child survival and safe motherhood interventions

Competency Nos.	Topics & Subtopics
CM10.5	Universal Immunization Program; Integrated Management of Neonatal and Childhood Illness (IMNCI) and other existing Programs.
CM10.6	Family planning methods, their advantages and shortcomings
CM10.7	Basis and principles of the Family Welfare Program including the organization, technical and operational aspects
CM10.8	Physiology, clinical management and principles of adolescent health including ARSH
CM10.9	Gender issues and women empowerment
	Occupational Health
CM11.1	Occupational illnesses including diseases in agricultural workers.
CM11.2	Role, benefits and functioning of the employees state insurance scheme
CM11.3	Specific occupational health hazards, their risk factors and preventive measures Prevention & control of occupational diseases : Medical, Engineering and other legislative measures
CM11.4	Principles of ergonomics in health preservation
CM11.5	Occupational disorders of health professionals and their prevention & management and interpretation and interpretation
	Geriatric services
CM12.1	Concept of Geriatric services
CM12.2	Health problems of aged population
CM12.3	Prevention of health problems of aged population
CM12.4	Describe National program for elderly
	Mental Health
CM15.1	Concept of mental Health
CM15.1	Warning signals of mental health disorder
CM15.1	National Mental Health program
	Health planning and management
CM16.1	Concept of Health planning
CM16.2	Planning cycle
CM16.3	Health management techniques
CM16.4	Health planning in India and National policies related to health and health planning

Competency Nos.	Topics & Subtopics
	International Health
CM18.1	Concept of International health
CM18.2	Roles of various international health agencies
	Recent advances in Community Medicine
CM20.1	Important public health events of last five years
CM20.2	Various issues during outbreaks and their prevention
CM20.3	Describe any event important to Health of the Community
CM20.4	Laws pertaining to practice of medicine such as Clinical establishment Act and Human Organ Transplantation Act and its implications

Third Professional Part I - Community Medicine: List of Practicals / DOAP/ SDL Activities

Competency no.	Practicals / DOAP / SDL Activities
CM 7.4	Exercises on calculation of morbidity and mortality indicators based on given set of data and their interpretation
CM6.1	Demonstration and exercises on Formulation of a research problem , research question & research hypothesis for a study
CM 7.5	Exercise on developing appropriate epidemiological study design and method for a given public health problem.
CM 7.9	Demonstration and hands on training of application of computers in epidemiology. Demonstration and hands on exercises of application of MS- Excel , Epi Info etc.
CM6.2	Demonstration and exercises on the methods of data collection, classification, analysis, interpretation and presentation of statistical data
CM6.3	Demonstration and exercises on the application of elementary statistical methods including test of significance in various study designs and interpretation of statistical tests.
CM6.4	Demonstration and exercises on Common sampling techniques, simple statistical methods, frequency distribution, measures of central tendency and dispersion
CM9.2	Calculation and interpretation of demographic indices including birth rate, death rate, fertility rates
CM9.2 SDL	A small scale survey of local customs and practices during pregnancy, childbirth, lactation and child feeding practices
CM 11.3	Visit to Industry- Assessment of occupational environment and preventive measures Exercise on occupational history taking
CM20.3 SDL	Describe any event important to Health of the Community

Third Professional Part I - Proposed Activities in Second Clinical Community Medicine Posting (6 weeks)

Duration(weeks)	Proposed Activities
Two weeks (Posting in Urban Health Centre / ANC/ FW clinic/ Obstetric wards)	**Preventive and Community Obstetrics (including Family Welfare)** a. Clinico social assessment of antenatal , postnatal cases b. Assessment of high risk mothers c. Neonatal assessment d. Assessment of eligible couples for family welfare services and health education e. Organization of community based maternal health services and health educational activity for mothers.
Two weeks (Posting in Urban Health Centre / Under five clinic / Immunization clinic / Paediatric wards)	**Preventive and Community Paediatrics . Adolescent Health Care** a. Health and Nutritional assessment of underfive child b. Clinico social case reviews of Nutritional Deficiency Diseases in children and childhood malnutrition c. Clinico social case reviews of common childhood infections such as ARI , fever with rash , acute GE , malarial fever etc d. Childhood immunization , organization of immunization session , assessment of cold chain etc e. School health examination , assessment of school environment , organization of health educational activity for school children
Two weeks (Posting in Urban Health Centre / Medicine wards)	**Non communicable diseases and Preventive Geriatrics** Clinico social case reviews of chronic non communicable diseases such as hypertension , diabetes mellitus , CHD , Stroke , COPD, Cancer , psychiatric disorders , geriatric health problems , occupational diseases etc.

Note:

1. **The observations/ reflections of family / hospital / community visits , DOAP sessions , Self directed learning activities (SDL) , practicals should be entered in the log book immediately after the assignment.**
2. **The observer / facilitator / teacher will provide the written brief feedback in the log book for the learner related to the competencies.**

Paper wise distribution of topics for Prelim & MUHS Annual Examination
Year: III-I MBBS Subject: Community Medicine

Paper	Section	Topics
I	A	MCQs on all topics of the paper I
		Concept of health and disease
		Epidemiology
		Screening for disease
		Communicable diseases & related NHP
		Emerging & Remerging diseases
		Sociology
		Environmental health
		Occupational Health
		Hospital waste management
		Biostatistics & Vital statistics
		AETCOM Module no. 3.1 & 3.3
II	A	MCQs on all topics of the paper II
		Demography & FP & NHP
		MCH, Geriatrics & related NHP
		Nutrition & related NHP
		Mental Health
		Health education & Communication
		Health planning & Management
		Health care delivery system
		Non communicable Diseases & related NHP
		International health
		Disaster Management

Internal Assessment
Subject: Community Medicine
Applicable w.e.f March 2020 onwards examination for batches admitted from June 2019 onwards

Phase	I-Exam (March)		
	Theory	Practical (Including 10 Marks for Journal- Nutrition & Log Book)	Total Marks
First MBBS	50	50	100

Phase	II-Exam			III-Exam		
	Theory (Jan)	Practical Two weeks after clinical posting (Mid Clinical Posting)	Total Marks	Theory **(May)**	Practical End of Clinical Posting	Total Marks
Second MBBS	50	50	100 s	50	50	100

Phase	IV-Exam (March)			V-Exam Preliminary examination-August		
	Theory	Practical End of Clinical Posting	Total Marks	Theory	Practical	Total Marks
III MBBS	50	50	100	200	100	300

1. Assessment in CBME is ONGOING PRCESS,

No Preparatory leave is permitted.

1. There shall be 5 internal assessment examinations in Community Medicine.
2. The suggested patterns of question paper for first three internal assessment theory examinations is given below. Pattern of the prelims examinations should be similar to the University examinations.
3. Internal assessment marks for theory and practical will be converted to out of 40 (theory) + 40 (practical). Internal assessment marks, after conversion, should be submitted to university within the stipulated time as per directives from the University. **Conversion Formula for calculation of marks in internal assessment examinations.**

Phase	**Theory**	**Practical**
Phase I	**50**	**50**
Phase II	**100**	**100**
Phase III Part I	**250**	**150**
Total	**400**	**300**
Conversion out of	**40**	**40**
Conversion formula	**Total marks in 4 IA theory examinations /10**	**Total marks in 4 IA Practical examinations /7.5**
Eligibility criteria after conversion	**16**	**16**
	Combined theory + Practical = 40	

4. While preparing Final Marks of Internal Assessment, the rounding-off marks shall done as illustrated in following table.

Total Internal Assessment Marks	Final rounded marks
33.01 to 33.49	33
33.50 to 33.99	34

5. Students must secure at least 50% marks of the total marks (combined in theory and practical / clinical; not less than 40 % marks in theory and practical separately) assigned for internal assessment in order to be eligible for appearing at the final University examination of that subject.

6. Internal assessment marks will not to be added to marks of the University examinations and will be shown separately in mark list.

7. <u>Remedial measures</u>

A. <u>Remedial measures for non-eligible students</u>

i) At the end of each internal assessment examination, students securing less than 50% marks shall be identified. Such students should be counseled at the earliest and periodically.

ii) Extra classes for such students may be arranged. If majority of the students found to be weak in a particular area then extra classes must be scheduled for all such students. Even after these measures, if a student is failed to secure 50% marks combined in theory and practical (40% separately in theory and practical) after prelim examination, the student shall not be eligible for final examination.

iii) Non eligible candidates are offered to reappear for repeat internal assessment examination/s, which must be conducted 2 months before next University examination. The pattern for this repeat internal assessment examination shall be similar to the final University examination. Only the marks in this examination shall be considered for deciding the eligibility criteria. Following conversion formula shall be used for converting the marks.

	Theory	Practical
Remedial examination (pattern as per final examination)	**200**	**100**
Conversion out of	**40**	**40**
Conversion formula	**Marks in remedial theory examinations /5**	**Marks in remedial Practical examinations /2.5**
Eligibility criteria after conversion	**16**	**16**
	Combined theory + Practical = 40	

B. <u>Remedial measures for absent students:</u>

If any of the students is absent for any of the 5 IA examinations due to any reasons, following measures shall be taken.

i. The student is asked to apply to the academic committee of the college for reexamination, through HOD, to ascertain the genuineness of the reason for absentee.

ii. If permitted by academic committee, an additional examination for such students is to be conducted after prelims examination. Marks for such additional examination shall be equal to the missed examination.

iii. Even if a student has missed more than one IA examination, he/she can appear for only one additional IA examination. In such scenario, eligibility should be determined by marks obtained in internal assessment examinations for which the candidate has appeared, without changing the denominator.

1st /2nd /3rdMBBS Practical Mark's Structure

Internal Assessment Examinations

(Applicable w.e.fOctober 2020 onwards examination for batches admitted from June 2019 onwards)

Seat No.	Subject :Community Medicine Practical – 1st Internal assessment -				
	Spotters marks	Log book	Skill assessment utrition exercises	Viva Voce	Practical Total
Max. Marks	10 marks	10-marks	10 marks	20 marks	50 marks

Seat No.	Subject :Community Medicine Practical – 2nd Internal assessment			
	Spotters	Log book	Viva Voce	Practical Total
Max. Marks	20 marks	10-marks	20 marks	50 marks

Seat No.	Subject :Community Medicine Practical – 3rd Internal assessment				
	Spotters marks	Log book	Clinico-epidemiological case	Viva Voce	Practical Total
Max. Marks	10 marks	10 marks	20 marks	10 marks	50 marks

Seat No.	Subject :Community Medicine Practical – 4th Internal assessment				
	Spotters marks	Log book	Clinico-epidemiological case	Viva Voce	Practical Total
Max. Marks	10 marks	10 marks	20 marks	10 marks	50 marks

Method of Clinico epidemiological Case evaluation

Sr.no.	Head	Marks allotted
01	Identifying and socio demographic information (with house landmark, facilities for health care)	05
02	Present and past illness history (with risk factors , exposures) Environmental , behavioural and family information	05
03	Demonstration of relevant clinical signs/skills	05
05	Management plan and relevant control measures at individual, family and community level	05
	Total	20

III-I MBBS Practical Mark's Structure (Prelim exam)

Applicable w.e.f October 2021onwards examination for batches admitted from June 2019 onwards

Subject: Community Medicine						
Practical					Oral/Viva	Total
Seat No.	Spotters	Statistical Ex	Clinicoepidemilogical case	Skill assessment (10 skills) *	Viva/ voce	Practical &Oral
Max. Marks	20	20	20	20	20	100

- As per MCI competency based document

Method of Clinico epidemiological Case evaluation

Sr.no.	Head	Marks allotted
	Identifying and socio demographic information (with house landmark, facilities for health care)	05
	Present and past illness history (with risk factors , exposures) Environmental , behavioural and family information	05
	Demonstration of relevant clinical signs/skills	05
	Management plan and relevant control measures at individual, family and community level	05
	Total	20

III-I MBBS Practical Mark's Structure (University exam)

Applicable w.e.f October 2022onwards examination for batches admitted from June 2019 onwards

Subject: Community Medicine						
Practical					Oral/Viva	Total
Seat No.	Spotters	Statistical Ex	Clinicoepidemilogical case	Skill assessment (10 skills) *	Viva/ voce	Practical &Oral
Max. Marks	20	20	20	20	20	100

Format for Internal Assessment Theory Paper
IA – 1, IA – 2, IA – 3 & IA - 4

Question No.	Type of Question	No. of Questions	Max. Marks
1.	MCQ	10	10 (1 marks each)
2.	SAQ	5 (Any four out of 5)	28 (7 marks each)
3.	LAQ	1 (Compulsory)	12
		Total	50

MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES, NASHIK
FORMAT / SKELETON OF QUESTION PAPER-1

1. Course and Year	:	**III-I- MBBS** *(applicable w.e.f. October 2022 & onwards examinations)*						2. Subject Code	:		
3. Subject (PSP)	:	**Community Medicine**									
(TT)	:										
4. Paper :	:	**I**	5. Total Marks	:	**100**	6. Total Time	:	**3** Hrs.	7. Remu. (Rs)	:	Rs. 300/-
									8. Remu. (Rs)	:	Rs. 350/-
9. Web Pattern	:	[ ]	10. Web Skeleton	:	[ ]	11. Web Syllabus	:	[ ]	12. Web Old QP	:	[ ]

Instructions:

SECTION "A" MCQ

1) *Put ☒ in the appropriate box below the question number once only.*
2) *Use blue ball point pen only.*
3) *Each question carries **One mark.***
4) *Students will not be allotted mark if he/she overwrites strikes or put white ink on the cross once marked.*

SECTION "A" MCQ (20 Marks)

1. Multiple Choice Questions (Total 20 MCQ of One mark each) (20 x1 = 20)

a) b) c) d) e) f) g) h) i) j)

k) l) m) n) o) p) q) r) s) t)

SECTION "B"

Instructions:

1) *Use **blue/black** ball point pen only.*
2) ***Do not** write anything on the **blank portion of the question paper**. If written anything, such type of act will be considered as an attempt to resort to unfair means.*
3) ***All** questions are **compulsory**.*
4) *The number to the **right** indicates **full** marks.*
5) *Draw diagrams **wherever** necessary.*
6) *Distribution of syllabus in Question Paper is only meant to cover entire syllabus within the stipulated frame. The Question paper pattern is a mere guideline. Questions can be asked from any paper's syllabus into any question paper. Students cannot claim that the Question is out of syllabus. As It is only for the placement sake, the distribution has been done.*
7) *Use a common answerbook for all sections.*

SECTION "B"

2.	Short Answer Questions	(One Question AETCOM(3.1 and 3.3)(compulsory)	(7x1=07)
	a)		
3.	Short Answer Questions	(Answer Any 3 out of 4)	(7x3=21)
	a) b) c) d)		
4.	Structured Long Answer Questions	(Compulsory)	(12x1=12)
	a)		
5.	Short Answer Questions	(Answer Any 4 out of 5)	(7x4=28)
	a) b) c) d) e)		
6.	Structured Long Answer Questions	(Compulsory)	(12x1=12)
	a)		

MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES, NASHIK
FORMAT / SKELETON OF QUESTION PAPER-

1. Course and Year	:	**III-I- MBBS** *(applicable w.e.f. October 2022& onwards examinations)*						2. Subject Code	:		
3. Subject (PSP)	:	**Community Medicine**									
(TT)	:										
4. Paper :	:	**II**	5. Total Marks	:	**100**	6. Total Time	:	**3** Hrs.	7. Remu. (Rs)	:	Rs. 300/-
									8. Remu. (Rs)	:	Rs. 350/-
9. Web Pattern	:	[ ]	10. Web Skeleton	:	[ ]	11. Web Syllabus	:	[ ]	12. Web Old QP	:	[ ]

Instructions:

SECTION "A" MCQ

1) ☒ *in the appropriate box below the question number once only.*
2) *Use blue ball point pen only.*
3) *Each question carries* ***One mark.***
4) *Students will not be allotted mark if he/she overwrites strikes or put white ink on the cross once marked.*

SECTION "A" MCQ (20 Marks)

1. Multiple Choice Questions (Total 20 MCQ of One mark each) (20 x1 = 20)

a) b) c) d) e) f) g) h) i) j)

k) l) m) n) o) p) q) r) s) t)

Instructions:

SECTION "B"

1) *Use* ***blue/black*** *ball point pen only.*
2) ***Do not*** *write anything on the* ***blank portion of the question paper****. If written anything, such type of act will be considered as an attempt to resort to unfair means.*
3) ***All*** *questions are* ***compulsory****.*
4) *The number to the* ***right*** *indicates* ***full*** *marks.*
5) *Draw diagrams* ***wherever*** *necessary.*
6) *Distribution of syllabus in Question Paper is only meant to cover entire syllabus within the stipulated frame. The Question paper pattern is a mere guideline. Questions can be asked from any paper's syllabus into any question paper. Students cannot claim that the Question is out of syllabus. As It is only for the placement sake, the distribution has been done.*
7) *Use a common answerbook for all sections.*

SECTION "B"

2. Short Answer Questions (Answer Any 4 out of 5) (7x4=28)

a) b) c) d) e)

3. Structured Long Answer Questions (Compulsory) (12x1=12)

a)

4. Short Answer Questions (Answer Any 4 out of 5) (7x4=28)

a) b) c) d) e)

5. Structured Long Answer Questions (Compulsory) (12x1=12)

a)

BOOKS RECMMENDED.

1. Text book of Community Medicine, Kulkarni A.P. and Baride J.P.
2. Park "s Textbook of Preventive and Social Medicine,
3. Principles of Preventive and Social Medicine, K. Mahajan
4. Textbook of Community Medicine, B. Shridhar Rao.
5. Essentials of Community Medicine, Suresh Chandra.
6. Textbook of Biostatistics, B. K. Mahajan
7. Review in Community Medicine, V.R. Sheshu Babu.
8. Reference Book for Community Medicine: "Principles and practice of Biostatistics", Author: Dr. J.V. Dixit

FURTHER READINGS.

Epidemiology and Management for health care for all P.V. Sathe and A.P. Sathe. Essentials of Preventive Medicine O.P. Ghai and Piyush Gupta.

Maharashtra University of Health Sciences Nashik

COMMUNITY MEDICINE LOGBOOK

For

1st, 2nd&3rd PROFESSIONAL MBBS

STUDENTS AS PER COMPETENCY

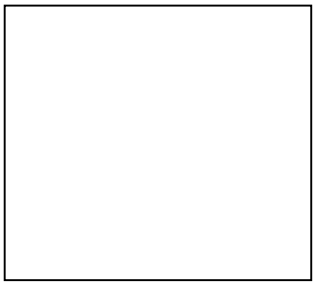
BASED CURRICULUM

First Edition:2020

All rights reserved

Logo of college

Name of the College:……

Personal details:  Paste recent self attested photo here	
Name of the student:	
Date of admission to MBBS Course:	
College Roll No:	
Permanent Address:	
E mail ID:	
Mobile Number: Self: Parent:	

Preface

The Medical Council of India has revised the undergraduate medical education curriculum so that the Indian Medical Graduate (IMG) is able to recognize **"Health for all"** as a national goal. He/she should also be able to fulfil his/her societal obligations. The revised curriculum has specified the competencies that a student must attain and clearly defined teaching learning strategies for the same. With this goal in mind, integrated teaching, skill development, AETCOM and self-directed learning have been introduced. There would be emphasis on communication skills, basic clinical skills and professionalism. There is a paradigm shift from the traditional didactic classroom-based teaching to learning environments where there is emphasis on learning by exploring, questioning, applying, discussing, analysing, reflecting, collaborating and doing. The recognition of this need is enshrined by a greatly enhanced allocation of time to these methods and also the assessment techniques. With this view in mind the log book has been designed as per the guidelines of competency Based curriculum.

Instructions

1) This logbook is prepared as per the guidelines of MCI for implementation of Competency based curriculum for 1st, 2nd& 3rd Professional MBBS students in the subject of Community Medicine.
2) Students are instructed to keep their logbook entries up to date.
3) Students are expected to write their reflections on all activities of Self-Directed Learning (SDL) and Visits.
4) Students also have to write reflections on AETCOM Module **3.1 and3.3**
5) Reflections should be structured using the following guiding questions:
    - What happened? (What did you learn from this experience)
    - So what? (What are the applications of this learning)
    - What next? (What knowledge or skills do you need to develop so that you can handle this type of situation?)
6) The logbook assessment will be based on multiple factors like
    - Attendance
    - Active participation in the sessions,
    - Timely completions
    - Quality of write up of reflections
    - Overall presentation

INDEX

Sr. No	Description	Page No.	Status	Signature of Teacher
			Complete/ Incomplete	
1.	**1st Professional**			
	a. Competencies			
	b. Self-Directed Learning (Seminars, Projects, Quizzes)			
	c. Certificate			
2.	**2nd Professional**			
a.	a. Competencies			
	b. Self-Directed Learning			
	c. Clinical posting - Cases			
	d. Visit			
	e. Certificate			
3.	**3rd Professional**			
	a. Competency			
	b. Self-Directed Learning			
	c. Clinical posting - Cases			
	d. Visit			
	e. Certificate			
4.	**AETCOM module**			
5.	**Attendance Record**			
6.	**Final certificate**			
7.	**Records of Internal Assessment**			

- AETCOM – Competencies for IMG, 2018, Medical Council of India.

FIRST PROFESSIONAL

List of Competencies

Competency No	COMPETENCY - The student should be able to
CM1.9	Demonstrate the role of effective Communication skills in health in a simulated environment
CM 1.10	Demonstrate the important aspects of the doctor patient relationship in a simulated environment
CM4.3	Demonstrate and describe the steps in evaluation of health promotion and education program
CM5.2	Describe and demonstrate the correct method of performing a nutritional assessment of individuals, families and the community by using the appropriate method
CM5.4	Plan and recommend a suitable diet for the individuals and families based on local availability of foods and economic status, etc in a simulated environment
CM9.2	Define, calculate and interpret demographic indices including birth rate, death rate, fertility rates

Competencies Sub Item:

Competency # addressed	**Name of Activity**	**Date completed: dd-mm-yyyy**	**Attempt at activity** First or Only (F) Repeat (R) Remedial (Re)	**Rating** Below(B) expectations Meets(M) expectations Exceeds (E) expectations OR Numerical Score	**Decision of faculty** Completed (C) Repeat (R) Remedial (Re)	**Initial of faculty and date**	**Feedback Receive**d Initial of learner

Competencies Sub Item:

Competency # addressed	**Name of Activity**	**Date completed: dd-mm-yyyy**	**Attempt at activity** First or Only (F) Repeat (R) Remedial (Re)	**Rating** Below(B) expectations Meets(M) expectations Exceeds (E) expectations OR Numerical Score	**Decision of faculty** Completed (C) Repeat (R) Remedial (Re)	**Initial of faculty and date**	**Feedback Receive**d Initial of learner

Reflection on Competencies

Topic: Date:

Signature of Teacher-in- charge

Reflection on Competencies

Topic: Date:

Signature of Teacher-in- charge

Reflection on Competencies

Topic: Date:

Signature of Teacher-in- charge

Reflection on Competencies

Topic: Date:

Signature of Teacher-in- charge

Reflection on Competencies

Topic: Date:

Signature of Teacher-in- charge

Reflection on Competencies

Topic: Date:

Signature of Teacher-in- charge

Self Directed Learning, (Seminars, Tutorials, Projects, Quizzes, small group discussions)

Sr. No	Self Directed Learning (Seminars, Tutorials, Projects, Quizzes, Group discussions etc.)	Date	Signature of Teacher

Reflection on Self-directed learning Experience

Topic: **Date:**

Signature of Teacher-in- charge

Reflection on Self-directed learning Experience

Topic: **Date:**

Signature of Teacher-in- charge

Reflection on Self-directed learning Experience

Topic: **Date:**

Signature of Teacher-in- charge

Reflection on Self-directed learning Experience

Topic: **Date:**

Signature of Teacher-in- charge

College Name: ……..

CERTIFICATE

This is to certify that,

Mr/Ms._____

Roll No._____has satisfactoril y attended/completed all assignments mentioned in this logbook as per the guidelines prescribed by Medical Council of India, for First Professional MBBS Competency Based Curriculum in the subject of Community Medicine.

Teacher- Incharge

Professor and Head
Department of Community Medicine

Date:_____/____/_____

Place:_____

SECOND PROFESSIONAL

List of Competencies

Competency No	COMPETENCY The student should be able to
CM2.1	Describe the steps and perform clinico-socio-cultural and demographic assessment of the individual, family and community
CM2.2	Describe the socio-cultural factors, family (types), its role in health and disease & demonstrate in a simulated environment the correct assessment of socio-economic status
CM2.3	Describe and demonstrate in a simulated environment the assessment of barriers to good health and health seeking behavior

Competencies Sub Item:

Competency # addressed	**Name of Activity**	**Date completed: dd-mm-yyyy**	**Attempt at activity** First or Only (F) Repeat (R) Remedial (Re)	**Rating** Below(B) expectations Meets(M) expectations Exceeds (E) expectations OR Numerical Score	**Decision of faculty** Completed (C) Repeat (R) Remedial (Re)	**Initial of faculty and date**	**Feedback Receive**d Initial of learner

Reflection on Competencies

Topic: Date:

Signature of Teacher-in- charge

Reflection on Competencies

Topic: Date:

Signature of Teacher-in- charge

Reflection on Competencies

Topic: Date:

Signature of Teacher-in- charge

Reflection on Competencies

Topic: Date:

Signature of Teacher-in- charge

Self Directed Learning, (Seminars, Tutorials, Projects, Quizzes)

Sr. No	Self Directed Learning (Seminars, Tutorials, Projects, Quizzes, Group discussions etc.)	Date	Signature of Teacher

Reflection on Self-directed learning Experience

Topic: **Date:**

Signature of Teacher-in- charge

Reflection on Self-directed learning Experience

Topic: **Date:**

Signature of Teacher-in- charge

Reflection on Self-directed learning Experience

Topic: **Date:**

Signature of Teacher-in- charge

Reflection on Self-directed learning Experience

Topic: **Date:**

Signature of Teacher-in- charge

CLINICAL POSTING: ……..……..

from……..to……..….

S.NO.	DATE	FAMILY VISIT/ CLINICAL DIAGNOSIS	TEACHER'S SIGN

Reflections

Topic: **Date:**

Signature of Teacher-in- charge

Reflections

Topic: **Date:**

Signature of Teacher-in- charge

Reflections

Topic: **Date:**

Signature of Teacher-in- charge

Reflections

Topic: **Date:**

Signature of Teacher-in- charge

Reflections

Topic: **Date:**

Signature of Teacher-in- charge

Reflections

Topic: **Date:**

Signature of Teacher-in- charge

VISIT:

COMPETENCY No.	VISIT	DATE	TEACHER'S SIGN.
3.2	Visit to water purification plant		
	Visit to Dist Public Health Laboratory		
	Exercise on interpretation of water analysis report		
3.4	Visit to sewage purification plant		

Reflection on visit:

Topic: **Date:**

Signature of Teacher-in- charge

Reflection on visit:

Topic: **Date:**

Signature of Teacher-in- charge

Reflection on visit:

Topic: **Date:**

Signature of Teacher-in- charge

Reflection on visit:

Topic: **Date:**

Signature of Teacher-in- charge

College name: ……..

CERTIFICATE

This is to certify that,

Mr /Ms._____

Roll No._____has satisfactoril y attended/completed all assignments mentioned in this logbook as per the guidelines prescribed by Medical Council of India, for Second Professional Competency Based Curriculum in the subject of Community Medicine.

Teacher- Incharge

Professor and Head
Department of Community Medicine

Date:_____/____/_____

Place:_____

SECOND PROFESSIONAL

List of competencies

Competency No	COMPETENCY The student should be able to
CM3.7	Identify and describe the identifying features and life cycles of vectors of Public Health importance and their control measures
CM8.6	Educate and train health workers in disease surveillance, control & treatment and health education

Competencies Sub Item:

Competency # addressed	**Name of Activity**	**Date completed: dd-mm-yyyy**	**Attempt at activity** First or Only (F) Repeat (R) Remedial (Re)	**Rating** Below(B) expectations Meets(M) expectations Exceeds (E) expectations OR Numerical Score	**Decision of faculty** Completed (C) Repeat (R) Remedial (Re)	**Initial of faculty and date**	**Feedback Receive**d Initial of learner

Reflection on Competencies

Topic: Date:

Signature of Teacher-in- charge

Reflection on Competencies

Topic: Date:

Signature of Teacher-in- charge

Self Directed Learning (Seminars, Tutorials, Projects, Quizzes)

Sr. No	Self Directed Learning (Seminars, Tutorials, Projects, Quizzes, Group discussions etc.)	Date	Signature of Teacher

Reflection on Self-directed learning Experience

Topic: **Date:**

Signature of Teacher-in- charge

Reflection on Self-directed learning Experience

Topic: **Date:**

Signature of Teacher-in- charge

Reflection on Self-directed learning Experience

Topic: **Date:**

Signature of Teacher-in- charge

Reflection on Self-directed learning Experience

Topic: **Date:**

Signature of Teacher-in- charge

CLINICAL POSTING: ……..

From ……to…….

S.NO.	DATE	FAMILY VISIT/ CLINICAL DIAGNOSIS	TEACHER'S SIGN

Reflections

Topic: **Date:**

Signature of Teacher-in- charge

Reflections

Topic: **Date:**

Signature of Teacher-in- charge

Reflections

Topic: **Date:**

Signature of Teacher-in- charge

Reflections

Topic: **Date:**

Signature of Teacher-in- charge

Reflections

Topic: **Date:**

Signature of Teacher-in- charge

Reflections

Topic: **Date:**

Signature of Teacher-in- charge

VISIT:

COMPETENCY No.	VISIT	DATE	TEACHER'S SIGN.
3.6	Visit to office of Dist Vector borne Diseases Control Program		
8.1	Visits to the Dist Offices/ Units/ clinics related to implementation of Disease Control Measures of Communicable Diseases		
8.1	Visit to Public Health Microbiology / Reference laboratories		
8.6	Visit to Dist Training Centre / Dist Disease Surveillance Unit		
13.4	Visit to Civil Defence Dept / Dist Disaster Management Office		
19.2	Visit to hospital pharmacy		

Reflection on visit:

Topic: **Date:**

Signature of Teacher-in- charge

Reflection on visit:

Topic: **Date:**

Signature of Teacher-in- charge

Reflection on visit:

Topic: **Date:**

Signature of Teacher-in- charge

Reflection on visit:

Topic: **Date:**

Signature of Teacher-in- charge

Reflection on visit:

Topic: **Date:**

Signature of Teacher-in- charge

Reflection on visit:

Topic: **Date:**

Signature of Teacher-in- charge

THIRD PROFESSIONAL

List of competencies

Competency No	COMPETENCY The student should be able to
CM6.2	Describe and discuss the principles and demonstrate the methods of collection, classification, analysis, interpretation and presentation of statistical data
CM6.3	Describe, discuss and demonstrate the application of elementary statistical methods including test of significance in various study designs
CM6.4	Enumerate, discuss and demonstrate Common sampling techniques, simple statistical methods, frequency distribution, measures of central tendency and dispersion
CM7.4	Define, calculate and interpret morbidity and mortality indicators based on given set of data
CM7.6	Enumerate and evaluate the need of screening tests
CM7.7	Describe and demonstrate the steps in the Investigation of an epidemic of communicable disease and describe the principles of control measures
CM9.2	Define, calculate and interpret demographic indices including birth rate, death rate, fertility rates

Competencies Sub Item:

Competency # addressed	**Name of Activity**	**Date completed: dd-mm-yyyy**	**Attempt at activity** First or Only (F) Repeat (R) Remedial (Re)	**Rating** Below(B) expectations Meets(M) expectations Exceeds (E) expectations OR Numerical Score	**Decision of faculty** Completed (C) Repeat (R) Remedial (Re)	**Initial of faculty and date**	**Feedback Receive**d Initial of learner

Competencies Sub Item:

Competency # addressed	**Name of Activity**	**Date completed: dd-mm-yyyy**	**Attempt at activity** First or Only (F) Repeat (R) Remedial (Re)	**Rating** Below(B) expectations Meets(M) expectations Exceeds (E) expectations OR Numerical Score	**Decision of faculty** Completed (C) Repeat (R) Remedial (Re)	**Initial of faculty and date**	**Feedback Receive**d Initial of learner

Reflection on Competencies

Topic: Date:

Signature of Teacher-in- charge

Reflection on Competencies

Topic: Date:

Signature of Teacher-in- charge

Reflection on Competencies

Topic: Date:

Signature of Teacher-in- charge

Reflection on Competencies

Topic: Date:

Signature of Teacher-in- charge

Reflection on Competencies

Topic: Date:

Signature of Teacher-in- charge

Reflection on Competencies

Topic: Date:

Signature of Teacher-in- charge

Reflection on Competencies

Topic: Date:

Signature of Teacher-in- charge

Reflection on Competencies

Topic: Date:

Signature of Teacher-in- charge

Self Directed Learning (Seminars, Tutorials, Projects, Quizzes)

Sr. No	Self Directed Learning (Seminars, Tutorials, Projects, Quizzes, Group discussions etc.)	Date	Signature of Teacher

Reflection on Self-directed learning Experience

Topic: **Date:**

Signature of Teacher-in- charge

Reflection on Self-directed learning Experience

Topic: **Date:**

Signature of Teacher-in- charge

Reflection on Self-directed learning Experience

Topic: **Date:**

Signature of Teacher-in- charge

Reflection on Self-directed learning Experience

Topic: **Date:**

Signature of Teacher-in- charge

CLINICAL POSTING: ……..

From ……to…….

S.NO.	DATE	CLINICAL DIAGNOSIS	TEACHER'S SIGN

Reflections

Topic: **Date:**

Signature of Teacher-in- charge

Reflections

Topic: **Date:**

Signature of Teacher-in- charge

Reflections

Topic: **Date:**

Signature of Teacher-in- charge

Reflections

Topic: **Date:**

Signature of Teacher-in- charge

Reflections

Topic: **Date:**

Signature of Teacher-in- charge

Reflections

Topic: **Date:**

Signature of Teacher-in- charge

VISIT:

COMPETENCY No.	VISIT	DATE	TEACHER'S SIGN.
CM 9.2	A small scale survey of local customs and practices during pregnancy, childbirth, lactation and child feeding practices		
CM 11.3	Visit to Industry- Assessment of occupational environment and preventive measures Exercise on occupational history taking		
CM 8.1	Visit to Public Health Microbiology / Reference laboratories		
CM 8.6	Visit to Dist Training Centre / Dist Disease Surveillance Unit		
CM 13.4	Visit to Civil Defence Dept / Dist Disaster Management Office		
CM 19.2	Visit to hospital pharmacy		

Reflection on visit:

Topic: **Date:**

Signature of Teacher-in- charge

Reflection on visit:

Topic: **Date:**

Signature of Teacher-in- charge

Reflection on visit:

Topic: **Date:**

Signature of Teacher-in- charge

Reflection on visit:

Topic: **Date:**

Signature of Teacher-in- charge

Reflection on visit:

Topic: **Date:**

Signature of Teacher-in- charge

Reflection on visit:

Topic: **Date:**

Signature of Teacher-in- charge

College Name: ……

CERTIFICATE

This is to certify that,

Mr/Ms._____

Roll No._____has satisfactoril y attended/completed all assignments mentioned in this logbook as per the guidelines prescribed by Medical Council of India, for Third Professional Competency Based Curriculum in the subject of Community Medicine.

Teacher- Incharge

Professor and Head
Department of Community Medicine

Date:_____/____/_____

Place:_____

4. AETCOM Module

Module 3.1: Clinician who understands and provides preventive, promotive, palliative and holistic care with compassion.

List of competencies

S. No	The student should be able to
1.	Demonstrate ability to communicate to patients in a patient, respectful, nonthreatening, non-judgmental and empathetic manner

Module 3.3: Communicator with patients, family, colleagues and community.

List of competencies

S. No	The student should be able to
1.	Administer informed consent and appropriately address patient queries to a patient undergoing a surgical procedure in a simulated environment

Competencies Sub Item:

Competency # addressed	**Name of Activity**	**Date completed: dd-mm-yyyy**	**Attempt at activity** First or Only (F) Repeat (R) Remedial (Re)	**Rating** Below(B) expectations Meets(M) expectations Exceeds (E) expectations OR Numerical Score	**Decision of faculty** Completed (C) Repeat (R) Remedial (Re)	**Initial of faculty and date**	**Feedback Receive**d Initial of learner

Reflection on AETCOM MODULE

Topic: **Date:**

Signature of Teacher-in- charge

Reflection on AETCOM MODULE

Topic: **Date**

Signature of Teacher-in- charge

College Name: ……..

FINAL CERTIFICATE (before prelims)

This is to certify that,

Mr/Ms._____

Roll No._____has satisfactorily attended/completed all assignments mentioned in this logbook as per the guidelines prescribed by Medical Council of India, for First, Second and Third Professional MBBS Competency Based Curriculum in the subject of Community Medicine.

Teacher- In charge

Professor and Head
Department of Community Medicine

Date:_____/____/_____ Place:_____

7. Record of Internal Assessment Examinations

Sr. No	Exam no	Theory	Practical including Viva	Signature of student	Signature of Teacher
1	I Internal Assessment	/50	/50		
2	II Internal Assessment	/50	/50		
3	III Internal Assessment	/50	/50		
4	IV Internal Assessment	/50	/50		
5	PRELIMS	/200	/100		
6	TOTAL				

Note: Above information is for the benefit of students and parents. In case of any discrepancy departmental record will be treated as final.

Course Content

PHASE II

Subject: Forensic Medicine & Toxicology

Second Professional

Theory / Practical

(Based on **National Medical Commission, India**, Competency based Undergraduate curriculum for the Indian Medical Graduate, 2018. Vol. 1; page nos. 228 -251)

FORENSIC MEDICINE AND TOXICOLOGY

1. Goals

The broad goal of the teaching of undergraduate students in Forensic Medicine is to produce a physician who is well informed about medicolegal responsibilities in practice of medicine. He /She will also be capable of making observations and inferring conclusions by logical deductions to set enquiries on the right track in criminal matters and connected medicolegal problems. He /She acquires knowledge of law in relation to medical practice, medical negligence and respect for codes of medical ethics

2. Objectives

2. (a) KNOWLEDGE:

At the end of the course, the student should be able to:

1. Identify the basic medicolegal aspects of hospital and general practice.
2. Define the medicolegal responsibilities of a general physician while rendering community service either in a rural primary health center or an urban health center.
3. Appreciate the physician's responsibilities in criminal matters and respect for the codes of medical ethics.
4. Diagnose, manage and identify also legal aspects of common acute and chronic poisonings.
5. Describe the medicolegal aspects and findings of post-mortem examination in case of death due to common unnatural conditions & poisonings.
6. Detect occupational and environmental poisoning, prevention and epidemiology of common poisoning and their legal aspects particularly pertaining to Workmen's Compensation Act.
7. Describe the general principles of analytical toxicology.
8. Medical jurisprudence in view of the Consumer Protection Act – wherein doctors have been covered under its ambit. They have both rights as well as responsibilities. Under medical insurance acts of negligence covered as well as rights for effective service delivery.

2. (b) SKILLS

At the end of the course, the student should be able to: -

1. Make observations and logical inferences in order to initiate enquiries in Criminal matters and medicolegal problems.
2. Diagnose and treat common emergencies in poisoning and manage chronic toxicity.
3. Make observations and interpret findings at postmortem examination.
4. Observe the principles of medical ethics in the practice of his profession.

2. (c) INTEGRATION

Department shall provide an integrated approach towards allied disciplines like Pathology, Radiology, Forensic Sciences, Hospital Administration etc. to impart training regarding medicolegal responsibilities of physicians at all levels of health care. Integration with relevant disciplines will provide scientific basis of clinical toxicology e.g., medicine, pharmacology etc.

3. Total duration for Forensic Medicine and Toxicology

a) Semesters: Total 4 Semesters

b) Teaching hours: 125

c) Phase (II): 50 hours

i. Lectures: 15 hours

ii. Self-Directed learning (SDL): 5 hours

iii. Small group teachings/tutorials/Integrated teaching/Practical: 30 hours

d) Phase (III/I): 75 hours

i. Lectures: 25 hours

ii. Self-Directed learning (SDL): 5 hours

iii. Small group teachings/tutorials/Integrated teaching/Practical: 45 hours

4. Syllabus

4. (a) Learning methods:

Lectures, tutorials, practical demonstrations, Small group teachings, integrated teaching, Self-Directed learning (SDL), ATECOM

4. (b)Distribution of teaching hours

Didactic lectures should not exceed one third of the time schedule; two third schedule should include practical, clinicals or/and small group discussions. Learning process should include living experiences, problem-oriented approach, case studies and community health care activities.

5. Topic wise distribution

1. Total Teaching hours : **50**
2. A. Lectures(hours): **15** B. Self-directed learning (hours) : **05**

C. Clinical Postings (hours): Nil.

D. Small group teachings/tutorials/Integrated teaching/Practical's (hours)**: 30**

Competency Nos.	**Topics & Subtopics-**	**TL Methods**
	PHASE II	
FM 1.1, 1.3, 1.4	**Topic: General Information** FM 1.1 Demonstrate knowledge of basics of Forensic Medicine like definitions of Forensic medicine, Clinical Forensic Medicine, Forensic Pathology, State Medicine, Legal Medicine and Medical Jurisprudence FM1.3 Describe legal procedures including Criminal Procedure Code, Indian Penal Code, Indian Evidence Act, Civil and Criminal Cases, Inquest (Police Inquest and Magistrate's Inquest), Cognizable and Non-cognizable offences FM1.4 Describe Courts in India and their powers: Supreme Court, High Court, Sessions court, Magistrate's Court, Labour Court, Family Court, Executive Magistrate Court and Juvenile Justice Board	**Lecture-01**
FM 1.2	FM1.2 Describe history of Forensic Medicine	**SDL-01**

Competency Nos.	Topics & Subtopics-	TL Methods
FM 1.5, 1.6, 1.7, 1.8, 1.9	**Topic: General Information** FM1.5 Describe Court procedures including issue of Summons, conduct money, types of witnesses, recording of evidence oath, affirmation, examination in chief, cross examination, re-examination and court questions, recording of evidence & conduct of doctor in witness box FM1.6 Describe Offenses in Court including Perjury; Court strictures vis-a- vis Medical Officer FM1.7 Describe Dying Declaration & Dying Deposition	**Lecture-02**
FM 1.8, 1.9	**Topic: General Information** FM1.8 Describe the latest decisions/notifications/resolutions/ circulars/standing orders related to medico-legal practice issued by Courts/Government authorities etc. F.M1.9 Describe the importance of documentation in medical practice in regard to medicolegal examinations, Medical Certificates and medicolegal reports	**Lecture-03**
FM 14.20	**Skills in Forensic Medicine & Toxicology** FM14.20 To record and certify dying declaration in a simulated/ supervised environment	**Small group- 1 teachings/tutorials/ Integrated teaching/Practical's**
FM 2.29, 14.22	**Topic: General Information** FM 2.29 Demonstrate respect to the directions of courts, while appearing as witness for recording of evidence under oath or affirmation, examination in chief, cross examination, re-examination and court questions, recording of evidence **Skills in Forensic Medicine & Toxicology** FM14.22 To give expert medical/ medico-legal evidence in Court of law	**Small group-2 teachings/tutorials/ Integrated teaching/Practical's**
FM 3.1	**Clinical Forensic Medicine** **IDENTIFICATION** FM 3.1 Define and describe Corpus Delicti, establishment of identity of living persons including race, Sex, religion, complexion, stature, age determination using morphology, teeth-eruption, decay, bite marks, bones-ossification centres, medico-legal aspects of age-**Part 1**	**Lecture-04**
	IDENTIFICATION FM 3.1 Define and describe Corpus Delicti, establishment of identity of living persons including race, Sex, religion, complexion, stature, age determination using morphology, teeth-eruption, decay, bite marks, bones-ossification centres, medico-legal aspects of age-**Part 2**	**Lecture-05**
FM 3.1	**IDENTIFICATION** FM 3.1 age determination using morphology, teeth-eruption, bones-ossification centres, medico-legal aspects of age	**Small group- 3 teachings/tutorials/ Integrated teaching**

Competency Nos.	Topics & Subtopics-	TL Methods
		/Practical's
FM 3.2	**IDENTIFICATION** FM 3.2 Describe and discuss identification of criminals, unknown persons, dead bodies from the remains-hairs, fibers, teeth, anthropometry, dactylography, foot prints, scars, tattoos, poroscopy and superimposition	**Lecture-06**
FM 3.2	**IDENTIFICATION** FM 3.2 Dactylography, foot prints, scars, tattoos, poroscopy and superimposition	**Small group- 4 teachings/tutorials/ Integrated teaching /Practical's**
FM 2.1,2.2,2.3	**Forensic Pathology** FM2.1 Define, describe and discuss death and its types including somatic/clinical/cellular, molecular and brain-death, Cortical Death and Brainstem Death FM2.2 Describe and discuss natural and unnatural deaths FM2.3 Describe and discuss issues related to sudden natural deaths	**Lecture-07**
FM 2.5, 2.6. 2.7 2.8	**Forensic Pathology** FM2.5 Discuss moment of death, modes of death - coma, asphyxia and syncope FM2.6 Discuss presumption of death and survivorship FM2.7 Describe and discuss suspended animation FM 2.8 Describe and discuss postmortem changes including signs of death, cooling of body, post-mortem lividity, rigor mortis, cadaveric spasm, cold stiffening and heat stiffening	**Lecture-08**
FM 2.9	**Forensic Pathology** FM2.9 Describe putrefaction, mummification, adipocere and maceration	**Lecture-09**
FM 2.10	**Forensic Pathology** FM2.10 Discuss estimation of time since death	**Lecture-10**
FM 2.11, 2.12, 2.13, 2.14	**Forensic Pathology** FM2.11 Describe and discuss autopsy procedures including post-mortem examination, different types of autopsies, aims and objectives of post-mortem examination FM2.12 Describe the legal requirements to conduct post-mortem examination and procedures to conduct medico-legal post-mortem examination FM2.13 Describe and discuss obscure autopsy FM2.14 Describe and discuss examination of clothing, preservation of viscera on post-mortem examination for chemical analysis and other medico-legal purposes, post-mortem artefacts	**Small group- 5 teachings/tutorials/ Integrated teaching/Practical's**
FM 2.15, 2.16,	**Forensic Pathology** FM 2.15 Describe special protocols for conduction of medico-legal	**Small group- 6 teachings/tutorials/**

Competency Nos.	Topics & Subtopics-	TL Methods
2.17, 2.18	autopsies in cases of death in custody or following violation of human rights as per National Human Rights Commission Guidelines FM2.16 Describe and discuss examination of mutilated bodies or fragments, charred bones and bundle of bones. FM2.17 Describe and discuss exhumation. FM2.18 Crime Scene Investigation:- Describe and discuss the objectives of crime scene visit, the duties & responsibilities of doctors on crime scene and the reconstruction of sequence of events after crime scene investigation	**Integrated teaching/Practical's**
FM 1.10 1.11	**Forensic Pathology** FM1.10 Select appropriate cause of death in a particular scenario by referring ICD 10 code FM1.11Write a correct cause of death certificate as per ICD 10 document	**Small group- 7 teachings/tutorials/ Integrated teaching/Practical's**
FM 2.19	**Forensic Pathology** FM 2.19 Investigation of anaesthetic, operative deaths: Describe and discuss special protocols for conduction of autopsy and for collection, preservation and dispatch of related material evidences	**Lecture-11**
FM 2.30	**Forensic Pathology** FM 2.30 Have knowledge/awareness of latest decisions/notifications/ resolutions/circulars/standing orders related to medico-legal practice issued by Courts/Government authorities etc	**SDL-2**
FM 2.33, 2.34, 2.35	**Forensic Pathology** FM 2.33 Demonstrate ability to use local resources whenever required like in mass disaster situations FM 2.34 Demonstrate ability to use local resources whenever required like in mass disaster situations FM 2.35 Demonstrate professionalism while conducting autopsy in medicolegal situations, interpretation of findings and making inference/opinion, collection preservation and dispatch of biological or trace evidences	**Small group- 8 teachings/tutorials/ Integrated teaching/Practical's**
FM 14.9	**Skills in Forensic Medicine & Toxicology** FM14.9 Demonstrate examination of & present an opinion after examination of skeletal remains in a simulated/ supervised environment	**Small group- 9 teachings/tutorials/ Integrated teaching/Practical's**
FM 14.4	**Skills in Forensic Medicine & Toxicology** FM14.4 Conduct and prepare report of estimation of age of a person for medico-legal and other purposes & prepare medico-legal report in a simulated/ supervised environment	**Small group- 10 teachings/tutorials/ Integrated teaching/Practical's**

Competency Nos.	Topics & Subtopics-	TL Methods
FM 14.21	**Skills in Forensic Medicine & Toxicology** FM14.21 To collect, preserve, seal and dispatch exhibits for DNA-Finger printing using various formats of different laboratories.	**Small group- 11 teachings/tutorials/ Integrated teaching/Practical's**
FM 8.1	**Toxicology: General Toxicology** FM8.1 Describe the history of Toxicology	**SDL-3**
FM 8.2, 8.3, 8.6, 8.7, 8.8	**Toxicology: General Toxicology** FM8.2 Define the terms Toxicology, Forensic Toxicology, Clinical Toxicology and poison FM8.3 Describe the various types of poisons, Toxicokinetics, and Toxicodynamics and diagnosis of poisoning in living and dead FM 8.6 Describe the general symptoms, principles of diagnosis and management of common poisons encountered in India FM 8.7 Describe simple Bedside clinic tests to detect poison/drug in a patient's body fluids FM 8.8 Describe basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination	**Lecture-12**
FM 8.4	**Toxicology: General Toxicology** FM8.4 Describe the Laws in relations to poisons including NDPS Act, Medico-legal aspects of poisons	**SDL-4**
FM 8.9	**Toxicology: General Toxicology** FM 8.9 Describe the procedure of intimation of suspicious cases or actual cases of foul play to the police, maintenance of records, preservation and dispatch of relevant samples for laboratory analysis.	**Small group-12 teachings/tutorials/ Integrated teaching/Practical's**
FM 8.10	**Toxicology: General Toxicology** FM8.10 Describe the general principles of Analytical Toxicology and give a brief description of analytical methods available for toxicological analysis: Chromatography – Thin Layer Chromatography, Gas Chromatography, Liquid Chromatography and Atomic Absorption Spectroscopy	**Small group-13 teachings/tutorials/ Integrated teaching/Practical's**
FM 9.1	**Toxicology : Chemical Toxicology** FM9.1 Describe General Principles and basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination with regard to: Caustics Inorganic – sulphuric, nitric, and hydrochloric acids; Organic- Carbolic Acid (phenol), Oxalic and acetylsalicylic acids	**Small group-14 teachings/tutorials/ Integrated teaching/Practical's**
FM 9.2	**Toxicology : Chemical Toxicology** FM9.2 Describe General Principles and basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination with regard	**Small group-15 teachings/tutorials/ Integrated teaching/Practical's**

Competency Nos.	Topics & Subtopics-	TL Methods
	to Phosphorus, Iodine, Barium	
FM 9.3	**Toxicology : Chemical Toxicology** FM9.3 Describe General Principles and basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination with regard to Arsenic, lead, mercury, copper, iron, cadmium and thallium	**Small group-16 teachings/tutorials/ Integrated teaching/Practical's**
FM 9.4	**Toxicology : Chemical Toxicology** FM9.4 Describe General Principles and basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination with regard to Ethanol, methanol, ethylene glycol	**Lecture-13**
FM 9.4	**Toxicology : Chemical Toxicology** FM9.4 Describe General Principles and basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination with regard to Ethanol, methanol, ethylene glycol	**Small group-17 teachings/tutorials/ Integrated teaching/Practical's**
FM 9.5	**Toxicology : Chemical Toxicology** FM9.5 Describe General Principles and basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination with regard to Organophosphates, Carbamates, Organochlorines, Pyrethroids, Paraquat, Aluminium and Zinc phosphide	**Small group-18 teachings/tutorials/ Integrated teaching/Practical's**
FM 9.6	**Toxicology : Chemical Toxicology** FM9.6 Describe General Principles and basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination with regard to Ammonia, carbon monoxide, hydrogen cyanide & derivatives, methyl isocyanate, tear (riot control) gases	**Small group-19 teachings/tutorials/ Integrated teaching/Practical's**
FM 10.1	**Pharmaceutical Toxicology** FM10.1 Describe General Principles and basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination with regard to: i. Antipyretics – Paracetamol, Salicylates ii. Anti-Infectives (Common antibiotics – an overview) iii. Neuropsychotoxicology Barbiturates, benzodiazepins phenytoin, lithium, haloperidol, neuroleptics, tricyclics	**Lecture-14**
FM 10.1	**Pharmaceutical Toxicology** FM10.1 Describe General Principles and basic methodologies in treatment of poisoning: decontamination, supportive therapy, antidote therapy, procedures of enhanced elimination with regard to:	**Small group-20 teachings/tutorials/ Integrated teaching/Practical's**

Competency Nos.	Topics & Subtopics-	TL Methods
	iv .Narcotic Analgesics, Anaesthetics, and Muscle Relaxants v. Cardiovascular Toxicology Cardiotoxic plants – oleander, odollam, aconite, digitalis vi.Gastro- Intestinal and Endocrinal Drugs – Insulin	
FM 11.1	**Toxicology : Biotoxicology** FM11.1 Describe features and management of Snake bite, scorpion sting, bee and wasp sting and spider bite	**Lecture-15**
FM 12.1	**Toxicology : Sociomedical Toxicology** FM12.1 Describe features and management of abuse/poisoning with following chemicals: Tobacco, cannabis, amphetamines, cocaine, hallucinogens, designer drugs & solvent	**Small group-21 teachings/tutorials/ Integrated teaching/Practical's**
FM 13.1	**Topic: Toxicology : Environmental Toxicology** FM13.1 Describe toxic pollution of environment, its medico-legal aspects & toxic hazards of occupation and industry	**SDL-5**
FM 13.2	**Topic: Toxicology : Environmental Toxicology** FM13.2 Describe medico-legal aspects of poisoning in Workman's Compensation Act	**Small group-22 teachings/tutorials/ Integrated teaching/Practical's**
FM 14.2	**Skills in Forensic Medicine & Toxicology** FM 14.2 Demonstrate the correct technique of clinical examination in a suspected case of poisoning & prepare medico-legal report in a simulated/ supervised environment	**Small group-23 teachings/tutorials/ Integrated teaching/Practical's**
FM 14.3	**Skills in Forensic Medicine & Toxicology** FM14.3 Assist and demonstrate the proper technique in collecting, preserving and dispatch of the exhibits in a suspected case of poisoning, along with clinical examination	**Small group-24 teachings/tutorials/ Integrated teaching/Practical's**
FM 14.6	**Skills in Forensic Medicine & Toxicology** FM14.6 Demonstrate and interpret medico-legal aspects from examination of hair (human & animal) fibre, semen & other biological fluids	**Small group-25 teachings/tutorials/ Integrated teaching/Practical's**
FM 14.7, 14.8	**Skills in Forensic Medicine & Toxicology** FM14.7 Demonstrate & identify that a particular stain is blood and identify the species of its origin FM14.8 Demonstrate the correct technique to perform and identify ABO & RH blood group of a person	**Small group-26 teachings/tutorials/ Integrated teaching/Practical's**
FM 14.16	**Skills in Forensic Medicine & Toxicology** FM14.16 To examine & prepare medico-legal report of drunk person in a simulated/ supervised environment	**Small group- 27 teachings/tutorials/ Integrated teaching/Practical's**

Competency Nos.	Topics & Subtopics-	TL Methods
FM 14.17	**Skills in Forensic Medicine & Toxicology** FM14.17 To identify & draw medico-legal inference from common poisons e.g. dhatura, castor, cannabis, opium, aconite copper sulphate, pesticides compounds, marking nut, oleander, Nux vomica, abrus seeds, Snakes, capsicum, calotropis, lead compounds & tobacco.	**Small group- 28 teachings/tutorials/ Integrated teaching/Practical's**
FM 14.17	**Skills in Forensic Medicine & Toxicology** FM14.17 To identify & draw medico-legal inference from common poisons e.g. dhatura, castor, cannabis, opium, aconite copper sulphate, pesticides compounds, marking nut, oleander, Nux vomica, abrus seeds, Snakes, capsicum, calotropis, lead compounds & tobacco.	**Small group- 29 teachings/tutorials/ Integrated teaching/Practical's**
FM 14.17	**Skills in Forensic Medicine & Toxicology** FM14.17 To identify & draw medico-legal inference from common poisons e.g. dhatura, castor, cannabis, opium, aconite copper sulphate, pesticides compounds, marking nut, oleander, Nux vomica, abrus seeds, Snakes, capsicum, calotropis, lead compounds & tobacco.	**Small group- 30 teachings/tutorials/ Integrated teaching/Practical's**

Course Content

Phase III-Part ONE

Subject: Forensic Medicine & Toxicology

Theory / Practical

(Based on **National Medical Commission, India** Competency based Undergraduate curriculum for the Indian Medical Graduate, 2018. Vol. 1; page nos. 228 -251)

1. Total Teaching hours **: 75**
2. A. Lectures(hours)**:25** B. Self-directed learning (hours) **:5**
   C. Clinical Postings (hours):
   D. Small group teachings/tutorials/Integrated teaching/ Practicals (hours**): 45**

AETCOM Modules-3.3-Foundation of Communication and 3.4-Confidentiality

Competency Nos.	Topics & Subtopics-	TL Methods
FM 4.2, 4.3, 4.4, 4.5, 4.22	**Medical Jurisprudence (Medical Law and ethics)** FM 4.2 Describe the Code of Medical Ethics 2002 conduct, Etiquette and Ethics in medical practice and unethical practices & the dichotomy FM 4.3 Describe the functions and role of Medical Council of India and State Medical Councils FM 4.4 Describe the Indian Medical Register FM 4.5 Rights/privileges of a medical practitioner, penal erasure, infamous conduct, disciplinary Committee, disciplinary procedures, warning notice and penal erasure 4.22 Explain Oath – Hippocrates, Charaka and Sushruta and procedure for administration of Oath.	**Lecture-1**
FM 4.1	**Medical Jurisprudence (Medical Law and ethics)** FM4.1 Describe Medical Ethics and explain its historical emergence	**SDL-1**
FM 4.7, 4.8, 4.9	**Medical Jurisprudence (Medical Law and ethics)** FM4.7 Describe and discuss the ethics related to HIV patients FM4.8 Describe the Consumer Protection Act-1986 (Medical Indemnity Insurance, Civil Litigations and Compensations), Workman's Compensation Act & ESI Act FM4.9 Describe the medico - legal issues in relation to family violence, violation of human rights, NHRC and doctors	**Small group- 1 teachings/tutorials/ Integrated teaching/ Practical's**
FM 4.6, 4.24, 4.28	**Medical Jurisprudence (Medical Law and ethics)** FM4.6 Describe the Laws in Relation to medical practice and the duties of a medical practitioner towards patients and society	**Lecture-2**

	FM4.24 Enumerate rights, privileges and duties of a Registered Medical Practitioner. Discuss doctor- patient relationship: professional secrecy and privileged communication FM4.28 Demonstrate respect to laws relating to medical practice and Ethical code of conduct prescribed by Medical Council of India and rules and regulations prescribed by it from time to time	
FM 4.10, 4.11	**Medical Jurisprudence (Medical Law and ethics)** FM4.10 Describe communication between doctors, public and media FM4.11 Describe and discuss euthanasia	**Small group- 2 teachings/tutorials/ Integrated teaching/ Practical's**
FM 4.12, 4.16, 4.17	**Medical Jurisprudence (Medical Law and ethics)** FM4.12 Discuss legal and ethical issues in relation to stem cell research FM4.16 Describe and discuss Bioethics FM4.17 Describe and discuss ethical Principles: Respect for autonomy, non- malfeasance, beneficence & justice	**Small group-3 teachings/tutorials/ Integrated teaching/ Practical's**
FM 4.18	**Medical Jurisprudence (Medical Law and ethics)** FM4.18 Describe and discuss medical negligence including civil and criminal negligence, contributory negligence, corporate negligence, vicarious liability, Res Ipsa Loquitor, prevention of medical negligence and defenses in medical negligence litigations	**Lecture-3**
FM 4.19	**Medical Jurisprudence (Medical Law and ethics)** FM4.19 Define Consent. Describe different types of consent and ingredients of informed consent. Describe the rules of consent and importance of consent in relation to age, emergency situation, mental illness and alcohol intoxication	**Lecture-4**
FM 4.20, 4.21	**Medical Jurisprudence (Medical Law and ethics)** FM4.20 Describe therapeutic privilege,Malingering, Therapeutic Misadventure, Professional Secrecy, Human Experimentation FM4.21 Describe Products liability and Medical Indemnity Insurance	**Lecture-5**
FM 4.23	**Medical Jurisprudence (Medical Law and ethics)** FM 4.23 Describe the modified Declaration of Geneva and its relevance	**SDL-2**
FM 4.25, 4.26, 4.27	**Medical Jurisprudence (Medical Law and ethics)** FM4.25 Clinical research & Ethics Discuss human experimentation including clinical trials FM4.26 Discuss the constitution and functions of ethical committees FM4.27 Describe and discuss Ethical Guidelines for Biomedical Research on Human Subjects & Animals	**Small group-4 teachings/tutorials/ Integrated teaching/ Practical's**

FM 2.4	**Forensic Pathology** FM 2.4 Describe salient features of the Organ Transplantation and The Human Organ Transplant (Amendment) Act 2011 and discuss ethical issues regarding organ donation	**Lecture-6**
FM 2.31	**Forensic Pathology** FM2.31 Demonstrate ability to work in a team for conduction of medico-legal autopsies in cases of death following alleged negligence medical dowry death, death in custody or following violation of human rights as per National Human Rights Commission Guidelines on exhumation	**Small group-5 teachings/tutorials/ Integrated teaching/ Practical's**
FM 4.14	**Medical Jurisprudence (Medical Law and ethics)** FM 4.14 Describe & discuss the challenges in managing medico-legal cases including development of skills in relationship management – Human behaviour, communication skills, conflict resolution techniques	**Small group- 6 teachings/tutorials/ Integrated teaching/ Practical's**
FM 4.15	**Medical Jurisprudence (Medical Law and ethics)** Describe the principles of handling pressure – definition, types, causes, sources and skills for managing the pressure while dealing with medico-legal cases by the doctor	**Small group- 7 teachings/tutorials/ Integrated teaching/ Practical's**
FM 4.29	**Medical Jurisprudence (Medical Law and ethics)** FM4.29 Demonstrate ability to communicate appropriately with media, public and doctors	**Small group- 8 teachings/tutorials/ Integrated teaching/ Practical's**
FM 4.30	**Medical Jurisprudence (Medical Law and ethics)** FM4.30 Demonstrate ability to conduct research in pursuance to guidelines or research ethics	**Small group- 9 teachings/tutorials/ Integrated teaching/ Practical's**
FM 3.4, 3.3	**Mechanical injuries and wounds:** FM 3.4 Define injury, assault & hurt. Describe IPC pertaining to injuries FM 3.3 Define, describe and classify different types of mechanical injuries, abrasion, bruise, laceration, stab wound, incised wound, chop wound, defense wound, self-inflicted/fabricated wounds and their medico-legal aspects	**Lecture-7**
FM 3.3	**Mechanical injuries and wounds:** FM 3.3 Define, describe and classify different types of mechanical injuries, abrasion, bruise, laceration, stab wound, incised wound, chop wound, defense wound, self-inflicted/fabricated wounds	**Lecture-8**
FM 3.3	**Mechanical injuries and wounds:** FM 3.3 Define, describe and classify different types of mechanical injuries, abrasion, bruise, laceration, stab wound, incised wound, chop wound, defense wound, self-inflicted/fabricated wounds	**Lecture-9**
FM 3.3	**Mechanical injuries and wounds:** FM 3.3 Define, describe and classify different types of mechanical injuries, abrasion, bruise, laceration, stab wound, incised wound, chop wound, defense wound, self-inflicted/fabricated wounds	**Lecture-10**

FM 3.5	**Mechanical injuries and wounds:** FM3.5 Describe accidental, suicidal and homicidal injuries. Describe simple, grievous and dangerous injuries. Describe ante-mortem and post-mortem injuries	**Small group-10 teachings/tutorials/ Integrated teaching/ Practical's**
FM 3.6	**Mechanical injuries and wounds:** FM3.6 Describe healing of injury and fracture of bones with its medico-legal importance	**Small group-11 teachings/tutorials/ Integrated teaching/ Practical's**
FM 3.7	**Mechanical injuries and wounds:** FM3.7 Describe factors influencing infliction of injuries and healing, examination and certification of wounds and wound as a cause of death: Primary and Secondary	**Small group-12 teachings/tutorials/ Integrated teaching/ Practical's**
FM 3.8	**Mechanical injuries and wounds:** FM3.8Describe and discuss different types of weapons including dangerous weapons and their examination	**Small group-13 teachings/tutorials/ Integrated teaching/ Practical's**
FM 3.9	**Firearm injuries:** FM3.9 Describe different types of firearms including structure and components. Along with description of ammunition propellant charge and mechanism of fire-arms, different types of cartridges and bullets and various terminology in relation of firearm – caliber, range, choking	**Lecture-11**
FM 3.10	**Firearm injuries:** FM3.10 Describe and discuss wound ballistics-different types of firearm injuries, blast injuries and their interpretation, preservation and dispatch of trace evidences in cases of firearm and blast injuries, various tests related to confirmation of use of firearms	**Lecture-12**
FM 3.10	**Firearm injuries:** FM3.10 Describe and discuss wound ballistics-different types of firearm injuries, blast injuries and their interpretation, preservation and dispatch of trace evidences in cases of firearm and blast injuries, various tests related to confirmation of use of firearms	**Lecture-13**
FM 3.11	**Regional Injuries:** FM3.11 Describe and discuss regional injuries to head (Scalp wounds, fracture skull, intracranial haemorrhages, coup and contrecoup injuries), neck, chest, abdomen, limbs, genital organs, spinal cord and skeleton	**Lecture-14**
FM 3.12	**Regional Injuries** FM3.12 Describe and discuss injuries related to fall from height and vehicular injuries – Primary and Secondary impact, Secondary injuries, crush syndrome, railway spine	**Small group-14 teachings/tutorials/ Integrated teaching/ Practical's**
FM 2.24	**Forensic Pathology**	**Lecture-15**

	FM2.24 Thermal deaths: Describe the clinical features, post-mortem finding and medicolegal aspects of injuries due to physical agents like heat (heat-hyper-pyrexia, heat stroke, sun stroke, heat exhaustion/prostration, heat cramps [miner's cramp] or cold (systemic and localized hypothermia, frostbite, trench foot, immersion foot)	
FM 2.25	**Forensic Pathology** FM2.25 Describe types of injuries, clinical features, patho-physiology, post- mortem findings and medico-legal aspects in cases of burns, scalds, lightening, electrocution and radiations	**Lecture-16**
FM 2.26	**Forensic Pathology** FM 2.26 Describe and discuss clinical features, post-mortem findings and medico-legal aspects of death due to starvation and neglect	**SDL-3**
FM 14.1	**Skills in Forensic Medicine and Toxicology** FM14.1 Examine and prepare Medico-legal report of an injured person with different etiologies in a simulated/ supervised environment	**Small group-15 teachings/tutorials/ Integrated teaching/ Practical's**
FM 14.10	**Skills in Forensic Medicine and Toxicology** FM14.10 Demonstrate ability to identify & prepare medicolegal inference from specimens obtained from various types of injuries e.g. contusion, abrasion, laceration, firearm wounds, burns, head injury and fracture of bone	**Small group-16 teachings/tutorials/ Integrated teaching/ Practical's**
FM 14.11	**Skills in Forensic Medicine and Toxicology** FM14.11 To identify & describe weapons of medicolegal importance which are commonly used e.g. lathi, knife, kripan, axe, gandasa, gupti, farsha, dagger, bhalla, razor & stick. Able to prepare report of the weapons brought by police and to give opinion regarding injuries present on the person as described in injury report/ PM report so as to connect weapon with the injuries. (Prepare injury report/ PM report must be provided to connect the weapon with the injuries)	**Small group-17 teachings/tutorials/ Integrated teaching/ Practical's**
FM 14.12	**Skills in Forensic Medicine and Toxicology** FM14.12 Describe the contents and structure of bullet and cartridges used & to provide medico-legal interpretation from these	**Small group-18 teachings/tutorials/ Integrated teaching/ Practical's**
FM 2.20, 2.21	**Mechanical asphyxia:** FM2.20 Define, classify and describe asphyxia and medico-legal interpretation of post-mortem findings in asphyxial deaths	**Lecture-17**
	Mechanical asphyxia: FM2.21 Describe and discuss different types of hanging and strangulation including clinical findings, causes of death, post-mortem findings and medico-legal aspects of death due to hanging and strangulation including examination, preservation	

	and dispatch of ligature material	
FM 2.21	**Mechanical asphyxia:** FM2.21 Describe and discuss different types of hanging and strangulation including clinical findings, causes of death, post-mortem findings and medico-legal aspects of death due to hanging and strangulation including examination, preservation and dispatch of ligature material	**Lecture-18**
FM 2.22	**Mechanical asphyxia:** FM 2.22 Describe and discuss patho-physiology, clinical features, post- mortem findings and medico-legal aspects of traumatic asphyxia, obstruction of nose & mouth, suffocation and sexual asphyxia	**Lecture-19**
FM 2.23	**Mechanical asphyxia:** FM2.23 Describe and discuss types, patho-physiology, clinical features, post mortem findings and medico-legal aspects of drowning, diatom test and, gettler test.	**Lecture-20**
FM 3.18, 3.13	**SEXUAL OFFENCES** FM3.18 Describe anatomy of male and female genitalia, hymen and its types. Discuss the medico-legal importance of hymen. Define virginity, defloration, legitimacy and its medicolegal importance FM3.13 Describe different types of sexual offences. Describe various sections of IPC regarding rape including definition of rape (Section 375 IPC), Punishment for Rape (Section 376 IPC) and recent amendments notified till date	**Lecture-21**
FM 3.14	**SEXUAL OFFENCES** FM3.14 Describe and discuss the examination of the victim of an alleged case of rape, and the preparation of report, framing the opinion and preservation and dispatch of trace evidences in such cases	**Small group-19 teachings/tutorials/ Integrated teaching/ Practical's**
FM 3.15	**SEXUAL OFFENCES** FM3.15 Describe and discuss examination of accused and victim of sodomy, preparation of report, framing of opinion, preservation and dispatch of trace evidences in such cases	**Small group-20 teachings/tutorials/ Integrated teaching/ Practical's**
FM 4.13	**Medical Jurisprudence (Medical Law and ethics)** FM 4.13 Describe social aspects of Medico-legal cases with respect to victims of assault, rape, attempted suicide, homicide, domestic violence, dowry- related cases	**Small group-21 teachings/tutorials/ Integrated teaching/ Practical's**
FM 14.14	**Skills in Forensic Medicine and Toxicology** FM14.14 To examine & prepare report of an alleged accused in rape/unnatural sexual offence in a simulated/ supervised environment	**Small group-22 teachings/tutorials/ Integrated teaching/ Practical's**
FM 14.15	**Skills in Forensic Medicine and Toxicology** FM14.15 To examine & prepare medico-legal report of a victim of	**Small group-23 teachings/tutorials/**

	sexual offence/unnatural sexual offence in a simulated/ supervised environment	**Integrated teaching/ Practical's**
FM 3.16	**SEXUAL OFFENCES** **SEXUAL OFFENCES** FM3.16 Describe and discuss adultery and unnatural sexual offences- sodomy, incest, lesbianism, buccal coitus, bestiality, indecent assault and preparation of report, framing the opinion and preservation and dispatch of trace evidences in such cases	**Small group-24 teachings/tutorials/ Integrated teaching/ Practical's**
FM 3.17	**SEXUAL OFFENCES** FM3.17 Describe and discuss the sexual perversions fetishism, transvestism, voyeurism, sadism, necrophagia, masochism, exhibitionism, frotteurism, Necrophilia	**SDL-4**
FM 3.19	**SEXUAL OFFENCES** FM3.19 Discuss the medicolegal aspects of pregnancy and delivery, signs of pregnancy, precipitate labour superfoetation, superfecundation and signs of recent and remote delivery in living and dead	**Lecture-22**
FM 14.13	**SEXUAL OFFENCES** FM14.13 To estimate the age of foetus by post-mortem examination	**Small group-25 teachings/tutorials/ Integrated teaching/ Practical's**
FM 3.20	**SEXUAL OFFENCES** FM 3.20 Discuss disputed paternity and maternity	**Small group-26 teachings/tutorials/ Integrated teaching/ Practical's**
FM 3.21	FM 3.21 Discuss Pre-conception and Pre Natal Diagnostic Techniques (PC&PNDT) - Prohibition of Sex Selection Act 2003 and Domestic Violence Act 2005	**Small group-27 teachings/tutorials/ Integrated teaching/ Practical's**
FM 3.22, 3.23	**SEXUAL OFFENCES** FM 3.22 Define and discuss impotence, sterility, frigidity, sexual dysfunction, premature ejaculation. Discuss the causes of impotence and sterility in male and female FM 3.23 Discuss Sterilization of male and female, artificial insemination, Test Tube Baby, surrogate mother, hormonal replacement therapy with respect to appropriate national and state laws	**Small group-28 teachings/tutorials/ Integrated teaching/ Practical's**
FM 3.24, 3.25, 3.26	**SEXUAL OFFENCES** FM 3.24 Discuss the relative importance of surgical methods of contraception (vasectomy and tubectomy) as methods of contraception in the National Family Planning Programme FM 3.25 Discuss the major results of the National Family Health Survey FM 3.26 Discuss the national Guidelines for accreditation,	**Small group-29 teachings/tutorials/ Integrated teaching/ Practical's**

	supervision & regulation of ART Clinics in India	
FM 3.27, 3.28	FM 3.27 Define, classify and discuss abortion, methods of procuring MTP and criminal abortion and complication of abortion. MTP Act 1971 FM 3.28 Describe evidences of abortion - living and dead, duties of doctor in cases of abortion, investigations of death due to criminal abortion	**Lecture-23**
FM 3.29	**Torture and Human rights** FM3.29 Describe and discuss child abuse and battered baby syndrome	**Small group-30 teachings/tutorials/ Integrated teaching/ Practical's**
FM 3.30	**Torture and Human rights** FM3.30 Describe and discuss issues relating to torture, identification of injuries caused by torture and its sequalae, management of torture survivors	**Small group-31 teachings/tutorials/ Integrated teaching/ Practical's**
FM 3.31	**Torture and Human rights** FM3.31 Describe and discuss guidelines and Protocols of National Human Rights Commission regarding torture	**Small group-32 teachings/tutorials/ Integrated teaching/ Practical's**
FM 3.32	FM3.32 Demonstrate the professionalism while preparing reports in medicolegal situations, interpretation of findings and making inference/opinion, collection preservation and dispatch of biological or trace evidences	**Small group-33 teachings/tutorials/ Integrated teaching/ Practical's**
FM 3.33	**SEXUAL OFFENCES** FM3.33 Should be able to demonstrate the professionalism while dealing with victims of torture and human right violations, sexual assaults- psychological consultation, rehabilitation	**Small group-34 teachings/tutorials/ Integrated teaching/ Practical's**
FM 5.1, 5.2	**Forensic Psychiatry** FM5.1 Classify common mental illnesses including post-traumatic stress disorder (PTSD) FM5.2 Define, classify and describe delusions, hallucinations, illusion, lucid interval and obsessions with exemplification	**Lecture-24**
FM 5.3, 5.4	**Forensic Psychiatry** FM 5.3 Describe Civil and criminal responsibilities of a mentally ill person FM 5.4 Differentiate between true insanity from feigned insanity	**Lecture-25**
FM 5.5, 5.6	**Forensic Psychiatry** FM5.5 Describe & discuss Delirium tremens FM5.6 Describe the Indian Mental Health Act, 1987 with special	**Small group-35 teachings/tutorials/ Integrated teaching/**

	reference to admission, care and discharge of a mentally ill person	**Practical's**
FM 6.1	**Forensic Laboratory investigation in medical legal practice** FM 6.1 Describe different types of specimen and tissues to be collected both in the living and dead: Body fluids (blood, urine, semen, faeces saliva), Skin, Nails, tooth pulp, vaginal smear, viscera, skull, specimen for histo-pathological examination, blood grouping, HLA Typing and DNA Fingerprinting.	**Small group-36 teachings/tutorials/ Integrated teaching/ Practical's**
FM 6.1	**Forensic Laboratory investigation in medical legal practice** Describe Locard's Exchange Principle	**SDL-5**
FM 6.1	**Forensic Laboratory investigation in medical legal practice** FM 6.1 Describe different types of specimen and tissues to be collected both in the living and dead: Body fluids (blood, urine, semen, faeces saliva), Skin, Nails, tooth pulp, vaginal smear, viscera, skull, specimen for histo-pathological examination, blood grouping, HLA Typing and DNA Fingerprinting.	**Small group-37 teachings/tutorials/ Integrated teaching/ Practical's**
FM 6.2	**Forensic Laboratory investigation in medical legal practice** FM6.2Describe the methods of sample collection, preservation, labelling, dispatch, and interpretation of reports	**Small group-38 teachings/tutorials/ Integrated teaching/ Practical's**
FM 6.3	**Forensic Laboratory investigation in medical legal practice** FM6.3 Demonstrate professionalism while sending the biological or trace evidences to Forensic Science laboratory, specifying the required tests to be carried out, objectives of preservation of evidences sent for examination, personal discussions on interpretation of findings	**Small group-39 teachings/tutorials/ Integrated teaching/ Practical's**
FM 7.1	**Emerging technologies in Forensic Medicine** FM7.1 Enumerate the indications and describe the principles and appropriate use for: - DNA profiling - Facial reconstruction - Polygraph (Lie Detector) - Narcoanalysis, - Brain Mapping, - Digital autopsy, - Virtual Autopsy, - Imaging technologies	**Small group-40 teachings/tutorials/ Integrated teaching/ Practical's**
FM 7.1	**Emerging technologies in Forensic Medicine** FM7.1 Enumerate the indications and describe the principles and appropriate use for: - DNA profiling - Facial reconstruction - Polygraph (Lie Detector)	**Small group-41 teachings/tutorials/ Integrated teaching/ Practical's**

	- Narcoanalysis, - Brain Mapping, - Digital autopsy, - Virtual Autopsy, - Imaging technologies	
FM 14.21	**Skills in Forensic Medicine & Toxicology** FM14.21 To collect, preserve, seal and dispatch exhibits for DNA-Finger printing using various formats of different laboratories.	**Small group-42 teachings/tutorials/ Integrated teaching/ Practical's**
FM 14.18	**Skills in Forensic Medicine & Toxicology** FM14.18 To examine & prepare medico-legal report of a person in police, judicial custody or referred by Court of Law and violation of human rights as requirement of NHRC, who has been brought for medical examination	**Small group-43 teachings/tutorials/ Integrated teaching/ Practical's**
FM 14.19	**Skills in Forensic Medicine & Toxicology** FM14.19 To identify & prepare medico-legal inference from histo-pathological slides of Myocardial Infarction, pneumonitis, tuberculosis, brain infarct, liver cirrhosis, brain haemorrhage, bone fracture, Pulmonary oedema, brain oedema, soot particles, diatoms & wound healing	**Small group-44 teachings/tutorials/ Integrated teaching/ Practical's**
FM 14.5	**Skills in Forensic Medicine & Toxicology** FM14.5 Conduct & prepare post-mortem examination report of varied etiologies (at least 15) in a simulated/ supervised environment Journal and logbook checking-	**Small group-45 teachings/tutorials/ Integrated teaching/ Practical's** **It can be scheduled at any small groups as per availability of Post Mortem examination.**

MBBS

PHASE II& PHASE III Part -I

Internal Assessment

Subject: Forensic Medicine & Toxicology

Phase	I-Exam (After 3 months from start of II Phase-Jan in case phase II started in Oct.)			II-Exam (After three months of I Interna assessment Examination- Apr.)		
	Theory	Practical (Including 10 Marks for Journal & Log Book)	Total Marks	Theory	Practical Including 10 Marks for Journal & Log Book	Total Marks
II MBBS	**50**	**40+10=50**	**100**	**50**	**40+10=50**	**100**

Phase	I-Exam (After 3 months from start of III Phase- Jan/Feb in case phase III started in Oct.)			II-Exam (June/July-Preliminary)		
	Theory	Practical (Including 10 Marks for Journal & Log Book)	Total Marks	Theory	Practical	Total Marks
III/PART-I MBBS	**50**	**40+10=50**	**100**	**100**	**100**	**200**

1. There will be **4** internal assessment examinations in Forensic medicine. The structure of the Preliminary internal assessment theory examinations should be similar to the structure of University examination.
2. It is mandatory for the students to appear for all the internal assessment Examinations in the respective phases. A student who has not taken minimum required number of tests for Internal Assessment each in theory and practical will not be eligible for University examinations.

3. There will be only one additional examination for absent students (due to genuine reason) after approval by the Institutional Grievances Committee. It should be taken after preliminary examination and before submission of internal assessment marks to the University.
4. Internal assessment marks for theory will be out of 250 and practical will be out of 250.
5. Reduce total theory internal assessment to 40 marks and total practical internal assessment to 40 marks. Students must secure at least 50% marks of the total marks (combined in theory and practical; not less than 40 % marks in theory and practical separately) to be eligible for appearing University examination

6. **Conversion Formula for calculation of marks in internal assessment examinations**

	First IA II Phase	Second IA II Phase	Third IA III Phase Part -I	(Prelim) III Phase Part -I	Total	Internal assessment marks: Conversion formula (out of 40)	Eligibility to appear for final University examination (after conversion out of 40) (40% separately in Theory & Practical, 50% Combined)	
Theory	50	50	50	100	250	Total marks obtained / 6.25	16 (Minimum)	Total of Theory + Practical Must be 40.
Practical	50	50	50	100	250	Total marks obtained / 6.25	16 (Minimum)	

7. While preparing Final Marks of Internal Assessment, the rounding-off marks shall done as illustrated in following table

Internal Assessment Marks	Final rounded marks
15.01 to 15.49	15
15.50 to 15.99	16

8. Students must secure at least 50% marks of the total marks (combined in theory and practical / clinical; not less than 40 % marks in theory and practical
Separately) assigned for internal assessment in order to be eligible for appearing at the final University examination of that subject. Internal assessment marks will reflect as separate head of passing at the summative examination.

9. Internal assessment marks will not to be added to marks of the University examinations and will be shown separately in mark list.

Second & Third part I MBBS Practical Mark's Structure

Internal Assessment Examinations

INTERNAL ASSESSMENT EXAMINATION-AS PER THE SYLABUS OF THEORY AND PRACTICAL COVERED IN THAT SPECIFIC DURATION OF PHASE-AUTONOMY AT INSTITUTE LEVEL.

Theory Internal Assessment Pattern

Total marks-50

Section A-MCQ's-10 Marks

Section-B- Short Answer Questions-30 Marks (6 out 0f 7)-5 Marks Each

Section-C-Long Answer Questions-10 Marks (1 out of 2)-10 Marks each.

Practical Internal Assessment Pattern

Total Marks-50.

Exercises taught in that particular term-30 Marks

(Each Exercise marks should be as per University Exam pattern)

Viva-10 Marks

Journal and Log book-10 marks

Paper wise distribution of topics for Prelim & MUHS Annual Examination

Year: PHASE III,PART I , Subject: Forensic Medicine

Paper	Section	Topics
Only one paper	**Section A**	**MCQs on all topics of the paper I**
	Section B	**1Court Procedures**
		2.Identity
		3.Death and it's changes
		4.Toxicology
		5. Forensic Laboratory investigation in medical legal practice
	Section C	**1.Medical Jurisprudence**
		2.Injury-Mechanical,regional,thermal,lightning,electrical etc.
		3.Voilent Asphyxial deaths
		4.Sexual offences **5.Forensic Psychiatry** **6. AETCOM Modules.**
II Not applicable	A	

PHASE III PART I-MBBS Practical Mark's Structure MUHS

Subject: Forensic Medicine & Toxicology													
Practical										Oral/ Viva			Total
Seat No.	Medical Certificate of Cause of Death (MCCD)	Injury report	Survivor/ Accused of Sexual Assault report	Alcohol Intoxication Drunkenness report	Sickness/ Fitness certificate	Age/ Potency/ Foetus Report	Weapon Report	Spots- • Bone-1 • Specimen-1 • Poison-2 • X-ray/ Photograph/ Instrument/ Document-1	Total	Forensic Pathology, Clinical Forensic Medicine	Medical Jurisprudence and Toxicology	Total	Practical & Oral (I + L)
	A	B	C	D	E	F	G	H	I	J	K	L	M
Max. Marks	10	10	10	10	10	10	5	3 X 5= 15	80	10	10	20	100

Suggestions:

1. It is suggested that 2 exercises can be kept as actual case or in simulated environment.
2. In the spots -2 spots can be kept as **OSPE stations.**

Phase III Part I MBBS Practical Mark's Structure Preliminary Examination

Subject: Forensic Medicine & Toxicology													
Practical										Oral/ Viva			Total
Seat No.	Medical Certificate of Cause of Death (MCCD)	Injury report	Survivor/ Accused of Sexual Assault report	Alcohol Intoxication Drunkenness report	Sickness/ Fitness certificate	Age/ Potency/ Foetus Report	Weapon Report	Spots- • Bone-1 • Specimen-1 • Poison-2 • X-ray/ Photograph/ Instrument/ Document-1	Total	Forensic Pathology, Clinical Forensic Medicine	Medical Jurisprudence and Toxicology	Total	Practical & Oral (I + L)
	A	B	C	D	E	F	G	H	I	J	K	L	M
Max. Marks	10	10	10	10	10	10	5	3 X 5= 15	80	10	10	20	100

Suggestions:

1. It is suggested that 2 exercises can be kept as actual case or in simulated environment.
2. In the spots - 2 spots can be kept as **-OSPE stations.**

MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES, NASHIK
FORMAT / SKELETON OF QUESTION PAPER

1. Course and Year	:	**MBBS –PHASE III Part -I** *(applicable w.e.f. OCT 2022 & onwards examinations)*				2. Subject Code	:
3. Subject (PSP)	:	**Forensic Medicine & Toxicology**					
(TT)	:						
4. Paper :	: --	5. Total Marks	: **100**	6. Total Time	: **3 Hrs.**	7. Remu. (Rs)	: Rs. 300/-
						8. Remu. (Rs)	: Rs. 350/-
9. Web Pattern	: [ ]	10. Web Skeleton	: [ ]	11. Web Syllabus	: [ ]	12. Web Old QP	: [ ]

Instructions:

SECTION "A" MCQ

1) *Put ☒ in the appropriate box below the question number once only.*
2) *Use blue ball point pen only.*
3) *Each question carries **One mark.***
4) *Students will not be allotted mark if he/she overwrites strikes or put white ink on the cross once marked.*

SECTION "A" MCQ (20 Marks)

1. Multiple Choice Questions (Total 20 MCQ of One mark each) (20 x 1=20)

a) b) c) d) e) f) g) h) i) j)

k) l) m) n) o) p) q) r) s) t)

SECTION "B" & "C"

Instructions:

1) *Use **blue/black** ball point pen only.*
2) ***Do not** write anything on the **blank portion of the question paper**. If written anything, such type of act will be considered as an attempt to resort to unfair means.*
3) ***All** questions are **compulsory**.*
4) *The number to the **right** indicates **full** marks.*
5) *Draw diagrams **wherever** necessary.*
6) *Distribution of syllabus in Question Paper is only meant to cover entire syllabus within the stipulated frame. The Question paper pattern is a mere guideline. Questions can be asked from any paper's syllabus into any question paper. Students cannot claim that the Question is out of syllabus. As It is only for the placement sake, the distribution has been done.*
7) *Use a common answer book for all sections.*

SECTION "B" (40 Marks)

2 Short Answer Questions (Any 6 out of 7) (6x5=30)

a) b) c) d) e) f) g)

3 Long Answer Questions (Any 1 out of 2) (1x10=10)

a) b)

SECTION "C" (40Marks)

4. Short answer questions (One short note should be from AETCOM 3.3 and 3.4 is compulsory) (Any 6 out of 7) (6x5=30)

a) b) c) d) e) f) g)

5. Long Answer Questions (Any 1 out of 2) (1x10=10)

a) b)

Maharashtra University of Health Sciences, Nashik

FORENSIC MEDICINE AND TOXICOLOGYLOGBOOK for

PHASE II and PHASE III (Part 1) MBBS STUDENTS AS PER COMPETENCY BASED CURRICULUM

First Edition: 2021

Preface

The National Medical Commission has revised the undergraduate medical education curriculum so that the Indian Medical Graduate (IMG) is able to recognize **"Health for all"** as a national goal. He/she should also be able to fulfil his/her societal obligations. The revised curriculum has specified the competencies that a student must attain and clearly defined teaching learning strategies for the same. With this goal in mind, integrated teaching, skill development, AETCOM and self-directed learning have been introduced. There would be emphasis on communication skills, basic clinical skills and professionalism. There is a paradigm shift from the traditional didactic classroom-based teaching to learning environments where there is emphasis on learning by exploring, questioning, applying, discussing, analysing, reflecting, collaborating and doing. The recognition of this need is enshrined by a greatly enhanced allocation of time to these methods and also the assessment techniques. With this view in mind the log book has been designed as per the guidelines of Competency Based Curriculum.

Name of the College

_____

_____

Admission Year: _____

CERTIFICATE

This is to certify that,

Mr/Ms._____

Roll No. _____ has satisfactorily attended/completed all assignments mentioned in this logbook as per the guidelines prescribed by **National Medical Commission, India** for Phase II & Phase III (Part 1) MBBS Competency Based Curriculum in the subject of **FORENSIC MEDICINE & TOXICOLOGY**.

Date: ___/___/_____

Place: _____

Teacher In-charge **Professor and Head**

Department of FORENSIC MEDICINE & TOXICOLOGY

Instructions

1) This logbook is prepared as per the guidelines of NMC for implementation of Competency based curriculum for Phase II MBBS and Phage III Part one students in the subject of Forensic Medicine & Toxicology.

2) Students are instructed to keep their logbook entries up to date.

3) Students are expected to write minimum 2 reflections on any two activities each of Clinical Forensic Medicine skills & Self-Directed Learning (SDL).

4) Students also have to write reflections on AETCOM Module - Reflections should be structured using the following guiding questions:

- What happened? (What did you learn from this experience)
- So what? (What are the applications of this learning)
- What next? (What knowledge or skills do you need to develop so that you can handle this type of situation?)

5) The logbook assessment will be based on multiple factors like

- Attendance
- Active participation in the sessions
- Timely completions
- Quality of write up of reflections
- Overall presentation

INDEX

Sr. No	Description	Page No's	Status Complete/ Incomplete	Signature of Teacher
1	Clinical Forensic Medicine Skills			
2	Self-Directed Learning, Seminars, Projects, Quizzes			
3	AETCOM Module			
4	Attendance Records			
5	Records of Internal Assessment			

* AETCOM – Competencies for IMG, 2018, Medical Council of India.

Record of Clinical Forensic Medicine & Toxicology Skills

Subject: Forensic Medicine & Toxicology **Phase II & Phase III part I MBBS**

Sub Item: Practicals (Student Lab.) / Practicals(Forensic Medicine & Toxicology) / Vertical Integration / Early Clinical Exposure / Seminar / Self Directed Learning

Competency # addressed	Name of Activity	Date completed : dd-mmyyyy	Attempt at activity First or Only (F) Repeat (R) Remedial (Re)	Rating Below (B) expectations Meets (M) expectations Exceeds (E) expectations OR Numerical Score	Decision of faculty Completed (C) Repeat (R) Remedial (Re)	Initial of faculty and date	Feedback Received Initial of learne
FM 14.20	To record and certify dying declaration in a simulated/ supervised environment						
FM 14.22	To give expert medical/ medico-legal evidence in Court of law						
FM 14.9	Demonstrate examination of & present an opinion after examination of skeletal remains in a simulated/ supervised environment						
FM 14.4	Conduct and prepare report of estimation of age of a person for medico-legal and other purposes & prepare medico-legal report in a simulated/ supervised environment						
FM 14.2	Demonstrate the correct						

	technique of clinical examination in a suspected case of poisoning & prepare medico-legal report in a simulated/ supervised environment						
FM 14.3	Assist and demonstrate the proper technique in collecting, preserving and dispatch of the exhibits in a suspected case of poisoning, along with clinical examination						
FM 14.6	Demonstrate and interpret medico-legal aspects from examination of hair (human & animal) fibre, semen & other biologicalfluids						
FM 14.7	Demonstrate & identify that a particular stain is blood and identify the species of itsorigin						
FM 14.8	Demonstrate the correct technique to perform and identify ABO &RH blood group of aperson						
FM 14.21	To collect, preserve, seal and dispatch exhibits for DNA-Finger printing using various formats of different laboratories.						
FM	To examine &						

14.16	prepare medico-legal report of drunk person in a simulated/ supervised environment						
FM 14.17	To identify & draw medico-legal inference from common poisons e.g. dhatura, castor, cannabis, opium, aconite copper sulphate, pesticides compounds, marking nut, oleander, Nux vomica, abrus seeds, Snakes, capsicum, calotropis, lead compounds & tobacco.						
FM 14.1	Examine and prepare Medico-legal report of an injured person with different etiologies in a simulated/ supervised environment						
FM 14.5	Conduct & prepare post-mortem examination report of varied etiologies (at least 15) in a simulated/ supervised environment						
FM 14.10	Demonstrate ability to identify & prepare medicolegal inference from specimens obtained from various types of injuries e.g. contusion, abrasion,						

	laceration, firearm wounds, burns, head injury and fracture ofbone						
FM 14.11	To identify & describe weapons of medicolegal importance which are commonly used e.g. lathi, knife, kripan, axe, gandasa, gupti, farsha, dagger, bhalla, razor &stick. Able to prepare report of the weapons brought by police and to give opinion regarding injuries present on the person as described in injury report/ PM report so as to connect weapon with the injuries. (Prepare injury report/ PM report must be provided to connect the weapon with the injuries)						
FM 14.12	Describe the contents and structure of bullet and cartridges used & to provide medico-legal interpretation from these						
FM 14.13	To estimate the age of foetus by post-mortem examination						
FM 14.14	To examine & prepare report of an alleged accused in						

	rape/unnatural sexual offence in a simulated/ supervised environment						
FM 14.15	To examine & prepare medico-legal report of a victim of sexual offence/unnatural sexual offence in a simulated/ supervised environment						
FM 14.18	To examine & prepare medico-legal report of a person in police, judicial custody or referred by Court of Law and violation of human rights as requirement of NHRC, who has been brought for medical examination						
FM 14.19	To identify & prepare medico-legal inference from histo pathological slides of Myocardial Infarction, pneumonitis, tuberculosis, brain infarct, liver cirrhosis, brain haemorrhage, bone fracture, Pulmonary oedema, brain oedema, soot particles, diatoms & wound healing						

Reflection on Clinical FORENSIC MEDICINE Skills

Name of the session:

Name of the faculty member/ presenter:

Date: **Time:** **Duration:**

Specific learning objectives of the session:

1)

2)

3)

Teaching Learning Methods:

- What happened? (What did you learn from this experience)

- So what? (What are the applications of this learning)

- What next? (What knowledge or skills do you need to develop so that you can handle this type of situation?)

Signature of Teacher-in- charge

Reflection on Clinical FORENSIC MEDICINE Skills

Name of the session:

Name of the faculty member/ presenter:

Date: **Time:** **Duration:**

Specific learning objectives of the session:

1)

2)

3)

Teaching Learning Methods:

- What happened? (What did you learn from this experience)

- So what? (What are the applications of this learning)

- What next? (What knowledge or skills do you need to develop so that you can handle this type of situation?)

Signature of Teacher-in- charge

Reflection on Clinical FORENSIC MEDICINE Skills

Name of the session:

Name of the faculty member/ presenter:

Date: **Time:** **Duration:**

Specific learning objectives of the session:

1)

2)

3)

Teaching Learning Methods:

- What happened? (What did you learn from this experience)

- So what? (What are the applications of this learning)

- What next? (What knowledge or skills do you need to develop so that you can handle this type of situation?)

Signature of Teacher-in- charge

2. Self-Directed Learning (SDL), Seminars, Tutorials, Projects, Quizzes

Sr.No	Self-Directed Learning, Seminars, Tutorials, Projects, Quizzes	Date	Signature of Teacher

Reflection on Self- Directed Learning (SDL) activities

Name of the session:

Name of the faculty member/ presenter:

Date: **Time:** **Duration:**

Specific learning objectives of the session:

1)

2)

3)

Teaching Learning Methods:

- What happened? (What did you learn from this experience)

- So what? (What are the applications of this learning)

- What next? (What knowledge or skills do you need to develop so that you can handle this type of situation?)

Signature of Teacher-in- charge

Reflection on Self- Directed Learning (SDL) activities

Name of the session:

Name of the faculty member/ presenter:

Date: **Time:** **Duration:**

Specific learning objectives of the session:

1)

2)

3)

Teaching Learning Methods:

- What happened? (What did you learn from this experience)

- So what? (What are the applications of this learning)

- What next? (What knowledge or skills do you need to develop so that you can handle this type of situation?)

Signature of Teacher-in- charge

Reflection on Self- Directed Learning (SDL) activities

Name of the session:

Name of the faculty member/ presenter:

Date: **Time:** **Duration:**

Specific learning objectives of the session:

1)

2)

3)

Teaching Learning Methods:

- What happened? (What did you learn from this experience)

- So what? (What are the applications of this learning)

- What next? (What knowledge or skills do you need to develop so that you can handle this type of situation?)

Signature of Teacher-in- charge

3: AETCOM Module

Reflection on AETCOM module

Name of the session:

Name of the faculty member/ presenter:

Date: **Time:** **Duration:**

Specific learning objectives of the session:

1)

2)

3)

Teaching Learning Methods:

- What happened? (What did you learn from this experience)

- So what? (What are the applications of this learning)

- What next? (What knowledge or skills do you need to develop so that you can handle this type of situation?)

Signature of Teacher-in- charge

Reflection on AETCOM module

Name of the session:

Name of the faculty member/ presenter:

Date: **Time:** **Duration:**

Specific learning objectives of the session:

1)

2)

3)

Teaching Learning Methods:

- What happened? (What did you learn from this experience)

- So what? (What are the applications of this learning)

- What next? (What knowledge or skills do you need to develop so that you can handle this type of situation?)

Signature of Teacher-in- charge

Reflection on AETCOM module

Name of the session:

Name of the faculty member/ presenter:

Date: **Time:** **Duration:**

Specific learning objectives of the session:

1)

2)

3)

Teaching Learning Methods:

- What happened? (What did you learn from this experience)

- So what? (What are the applications of this learning)

- What next? (What knowledge or skills do you need to develop so that you can handle this type of situation?)

Signature of Teacher-in- charge

4A: Attendance Record of the Student

Sr. No	Phase	Theory (%)	Practical (%)	Signature of the Student	Signature of the Teacher
A	Phase II				
B	Phase III – Part - I				
C	OVER ALL ATTENDANCE				

Note: Above information is for the benefit of students and parents. In case of any discrepancy departmental record will be treated as final.

SECTION 4B: Details of attending extra classes [For poor attendance (if any)]

Sr.No	Date	Period	Total hrs	Signature of student	Signature of Teacher
Total hours					

Note: Above information is for the benefit of students and parents. In case of any discrepancy departmental record will be treated as final.

Section 5. Records of Internal Assessment Examinations

Records of Internal Assessment examinations

Sr.No	Exam	Theory	Practical including viva	Signature of student	Signature of Teacher
1	I Internal Assessment	/ 50	/ 50		
2	II Internal Assessment	/ 50	/ 50		
3	III Internal Assessment	/ 50	/ 50		
4	IV Internal Assessment (Prelim)	/100	/100		
4	Internal Assessment marks	/ 250	/ 250		
5	Betterment exam	/ 100	/ 100		
6	Final Internal Assessment	/ 250	/ 250		
7	Final Internal Assessment (After Conversion)				

Note: Above information is for the benefit of students and parents. In case of any discrepancy departmental record will be treated as final.

Maharashtra University of Health Sciences, Nashik

Practical Journal

Forensic Medicine and Toxicology

Name of Institute: _____

_____

University Roll No: _____

Name of Student: _____

Roll No: _____ Batch: _____

Session From: _____to_____

CERTIFICATE

Certified that this is the Bonafide Record of the practical work done by Mr. / Miss _____

in the Department of Forensic Medicine and Toxicology, _____

_____

during the session from _____ to _____ and his / her work is satisfactory / not satisfactory.

University Roll No. _____

Phase	**Remark**	**Signature of In-charge with Date**
Phase II		
Phase III – Part I		

In-charge Practical Programme Professor & Head

Sign/s of University Examiner/s & Date

Code of Medical Ethics

1. I solemnly pledge myself to consecrate my life to the service of humanity.
2. Even under threat, I will not use my medical knowledge contrary to the laws of humanity.
3. I will maintain the utmost respect for human life from the time of conception.
4. I will not permit consideration of religion, nationality, race, party politics or social standing to intervene between my duty and my patient.
5. I will practice my profession with conscience and dignity.
6. The health of my patient is my first consideration.
7. I will respect the secrets, which are confided in me.
8. I will give my teachers the respect and gratitude, which is their due.
9. I will maintain in my power, the honour and the noble tradition of medical profession.
10. My colleagues will be my brothers.

I make these promises solemnly, freely and upon my honour.

Signature

Place: -

Name _____

Seal: -

Address _____

_____

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Instructions to the students for Practical work

1. Punctuality in attending practical classes should be maintained, as 80 % attendance in practical is mandatory to appear for university examinations.

2. Silence and discipline should be observed during practical work.

3. Clean apron should be worn before entering the practical hall.

4. Every student should bring the practical record, a piece of clean linen, a measuring tape, stethoscope, torch, hammer and a hand lens and coloured pencils.

5. Listen carefully to the instructions given by the teacher for the day's work.

6. After finishing the practical work, complete them in the record book, get the record checked by the teacher on the same day.

Part- I

Medico-legal and Medical Certificates

01. Examination of Skeletal Remains (Bones) For Medicolegal Purpose

1) **List of Bones received** (Name of Bone):--
   a. Gross anatomical characteristic

2) **Condition of Bone**: --
   Brittle, Soiled, Stained, Damaged, Partly Burnt

3) **Human or not:** --
   a. Gross anatomical characteristic b. Microscopic examination,
   c. Chemical analysis of bone ash d. Precipitin test or Antihuman Immunoglobulin

4) **Belong to one individual or more?**
   a. Number, side and size of the bones b. Age and Sex
   c. Morphological similarities d. Use of short wave ultra violet light
   e. X-ray comparison or trabecular pattern f. Neutron activation analysis

5) **Stature:** --(body Height/ length)
   a. Use of multiplication Factor/Regression equation

6) **Race of Individual:** --
   a. Racial peculiarities in the individual bones (various indices)

7) **Age of Individual:** -
   a. Dental status if skull or mandible is available b. Ossification status
   c. Secondary changes in the bones like closure of skull sutures, bony joint surface etc

8) **Sex of Individual:** --
   a. General Characteristic b. Specific Changes in the individual bone
   c. Examination of soft parts if available

9) **Injuries:**
   Ante mortem or Post-mortem or Could not be determined

10) **Manner of Separation:** -
   a. State of soft tissue if available with marks of bite/cut etc.
   b. Changes due to putrefaction

11) **Cause of Death:** -
   a. Any injuries/ fracture b. Foreign body –bullet, pellets or any piece of weapon
   c. Chemical analysis for poisoning d. Neutron activation analysis

12) **Time since Death:** -
   a. State of soft tissue if available b. Changes due to putrefaction
   c. Immunological test d. Precipitin test
   e. Nitrogen content test.

13) **Identification of Subject:** -
   a. Congenital abnormalities or deformities
   b. Acquired peculiarities –injuries fractures etc.
   c. Determination of the blood group from the marrow/ tooth pulp
   d. Age, sex/ Race and stature of the individual
   e. Radiological examination.

Examination of Skeletal Remains (Bones) For Medicolegal Purpose

To,
The Investigating Officer
_____Police Station_____

Subject: - Regarding Examination of Bones (Skeletal remains)
Reference: Your letter No._____ Dated_____ received on Date_____
ADR No/ C.R. No._____ u/s_____

Here with forwarding opinion regarding Skeletal remains Brought by PC_____B.No._____
_____Police Station_____.

Bones / Skeletal remains received in sealed /not sealed condition. Seal verified and found intact.

Observation / Examination Finding

1) List of Bones received: --(Name of Bone)

2) Condition of Bone: --

(Brittle, Soiled, Stained, Damaged, Intact)

3) Human or not: --

4) Belong to one individual or more?

5) Stature: -- (Multiplication factor/Regressive equation)

6) Race: --

7) Age: - A) Ossification Status
B) Secondary Changes
C) Dental Status (Skull, Mandible, Face)

8) Sex: -- A) General Characteristic
B) Specific Changes

9) Injuries: --

10) Manner of Separation:-

11) Cause of Death: -

12) Time since Death: -

13) Identification of Subject: -

Opinion: -

i) From the above finding, I am of opinion that the bone(s) belong to _____
origin of _____Sex and aged about_____
ii.) Cause of death _____
iii) Time since death _____

Signature
Place:- Name of Doctor _____
Seal:- Designation _____

Examination of Skeletal Remains (Bones) For Medicolegal Purpose

To,
The Investigating Officer
_____Police Station_____

Subject: - Regarding Examination of Bones (Skeletal remains)
Reference: Your letter No._____ Dated_____ received on Date_____
ADR No/ C.R. No._____ u/s_____

Here with forwarding opinion regarding Skeletal remains Brought by PC_____B.No._____
_____Police Station_____.

Bones / Skeletal remains received in sealed /not sealed condition. Seal verified and found intact.

Observation / Examination Finding

1) List of Bones received: --(Name of Bone)

2) Condition of Bone: --

(Brittle, Soiled, Stained, Damaged, Intact)

3) Human or not: --

4) Belong to one individual or more?

5) Stature: -- (Multiplication factor/Regressive equation)

6) Race: --

7) Age: - A) Ossification Status
B) Secondary Changes
C) Dental Status (Skull, Mandible, Face)

8) Sex: -- A) General Characteristic
B) Specific Changes

9) Injuries: --

10) Manner of Separation: -

11) Cause of Death: -

12) Time since Death: -

13) Identification of Subject: -

Opinion: -

i) From the above finding, I am of opinion that the bone(s) belong to _____
origin of _____Sex and aged about_____
ii.) Cause of death _____
iii) Time since death _____

Signature
Place:- Name of Doctor _____
Seal:- Designation _____

02. Age Estimation Report

Dental eruption and age-

Temporary Teeth	Eruption Time	Permanent Teeth	Eruption Time
Central incisors (Lower)	6-8 months	First molars	6-7 years
Central incisors (Upper)	7-9 months	Central incisors	6-8 years
Lateral incisors (Upper)	7-9 months	Lateral incisors	8-9 years
Lateral incisors (Lower)	10-12 months	First Bicuspid	9-11 years
first molars	12-14 months	Second Bicuspid	10-12 years
Canines	17-18 months	Canines	11-12 years
Second molars	20-30 months	Second molars	12-14 years
		Third molars	17-25 years

Development of hairs-

A) Axillary hair –

- 14 - 15 years : Brownish, soft space growth
- 16 –17 years : Thick, black, well grown

B) Beard and moustaches –

- 15 – 16 years – Begins to appear as downy, brown hair over chin.
  Moustaches appear earlier than beard.
  1-2 year after eruption hair became blackish and thick.

C) Pubic hairs –

- Stage I – Few brownish, downy hair (12-14 years)
- Stage II – darken and more curled pubic hair (14-16 years)
- Stage III - Darker, thicker, curly adult hair but no hair over medial surface of thigh (16-18 years)
- Stage IV – Thick, black curly pubic hair spread both over Mons pubis and medial surface of thighs (>18 years)

Ossification centres-

Joint	Bone	Appearance of Ossification centres	Fusion of ossification centres
Elbow	Humerus	**Lower end-** Capitulum-1 year Trochlea- 10 yrs Lateral epicondyle- 11 yrs Medial epicondyle- 6 to 7 yrs	Lower end of humerus complete fusion- 14 to 16 yrs
	Radius	Upper end (head) - 5 yrs	16 yrs
	Ulna	Upper end (Olecranon)- 9 yrs	16 yrs
Wrist	Radius	Lower end- 2 yrs	18-19 yrs
	Ulna	Lower end- 6 yrs	17-18 yrs
	Carpals	Pisiform-11 yrs, Trapezoid, Scaphoid-5yrs	Base of first metacarpal- 15 yrs
Pelvis	Tri-radiate cartilage	Separate centre in acetabulum-13 yrs	Fuses in acetabulum- 15 yrs
	Ischio-Pubic rami	---	Unites with each other- 6 yrs
	Femur	Lesser trochanter – 12 to 14 yrs	Head and both trochanters-17-18 yrs
		Iliac crest- 14 yrs	20-21 yrs
		Ischial tuberosity- 16 yrs	20-21 yrs

Tanner staging- sexual maturity

MALE (Genital development)

Stage 1: Pre-adolescent stage. Testis, penis, scrotum about same size as childhood. No pubic hair.

Stage 2: Enlargement of scrotum and testis. Skin of scrotum reddens and changes in texture. Scanty light pubic hair mainly at base of penis. Little enlargement of penis.

Stage 3: Further growth of scrotum. Pubic hair darkens and begins to curl. Penis enlarges mainly in length.

Stage 4: Increase in breadth of penis. Development of glans. Scrotum enlarges and darkens. Adult type of pubic hair but does not spread to medial part of thigh.

Stage 5: Genitalia adult type. (Penis-10-12cm, Volume of testis-20cc, length of testis-4cm or more) Pubic hair spreads to medial part of thigh.

FEMALE (Breast / Pubic hair development)

Stage1: Preadolescent; breast shows elevation of papilla only. No pubic hair

Stage2: Breast bud stage. Elevation of breast and papilla as a small mound. Enlargement of areola diameter. Scanty lightly pigmented pubic hair, mainly at labia.

Stage3: Further enlargement of breast and areola, no separation at contours. Pubic hair becomes darker and begins to curl.

Stage4: Projection of areola and papilla to form a secondary mound above the level of breast. Adult type of pubic hair less in amount and no spread to medial surface of thigh.

Stage5: Mature stage. Projection of nipple only; recession of areola to the level of general contour of breast. Adult feminine triangular type of pubic hair, may spread to medial side of thigh.

Age Estimation Report

A. Preliminary Information- Name: Shri/ Smt/ Kum. _____

Age as stated- _____ Sex- _____ Address- _____

Brought by: _____

Date: _____ Time: _____ MLC No: _____ Dated: _____

Consent: I am willing to get examined physically and radiologically for estimation of age.

(*This consent is explained to patient in _____ language*)

Signature/Thumb impression

(Subject/Guardian)

Examined in presence of-

Signature/Thumb impression

Identification Marks:

1. _____

   _____

2. _____

   _____

B. Clinical Examination:

Physical development _____ Height_____ Weight _____

Secondary Sexual Characters:

Male moustaches _____ Female Breast development _____

Beard_____ Menarche _____

Voice_____ Last Menstrual period (LMP)_____

Axillary hair_____ Axillary hair _____

Pubic hair_____ Pubic hair _____

External genitalia_____ External genitalia_____

C. Dental status-

Spacing behind second molar- _____ Abnormality if any-_____

D. Radiological Examination: Reference: x-ray plate no._____ Date- _____

1.

2.

3.

4.

<u>Conclusion</u>: From clinical, dental and radiological examinations, the age of the subject on date _____ is between _____ to_____ including margins of errors.

Date: -

Place: -

Seal

Signature

Name of Doctor _____

Designation _____

Age Estimation Report

A. Preliminary Information- Name: Shri/ Smt/ Kum. _____

Age as stated- _____ Sex- _____ Address- _____

Brought by: _____

Date: _____ Time: _____ MLC No: _____ Dated: _____

Consent: I am willing to get examined physically and radiologically for estimation of age.

(*This consent is explained to patient in _____ language*)

Signature/Thumb impression
(Subject/Guardian)

Examined in presence of-

Signature/Thumb impression-

Identification Marks:

1. _____
   _____
2. _____
   _____

B. Clinical Examination:

Physical development _____ Height_____ Weight _____

Secondary Sexual Characters:

Male moustaches _____ Female Breast development _____

Beard_____ Menarche _____

Voice_____ Last Menstrual period (LMP)_____

Axillary hair_____ Axillary hair _____

Pubic hair_____ Pubic hair _____

External genitalia_____ External genitalia_____

C. Dental status-

Spacing behind second molar- _____ Abnormality if any-_____

D. Radiological Examination: Reference: x-ray plate no._____ Date- _____

1.
2.
3.
4.

<u>Conclusion</u>: From clinical, dental and radiological examinations, the age of the subject on date _____ is between _____ to_____ including margins of errors.

Date: -
Place: -

Seal

Signature
Name of Doctor _____
Designation _____

03. Examination of Foetus for Age

To

The Investigating Officer

_____ Police Station _____

Subject: Submission of Report of Examination of Foetus for Age.
Reference: Your letter No._____ _____ Dated _____ _____ _____

Sir,

I am sending to you the Report of Examination of Foetus for Age.

Observations-

I. External Examination:

1. Length:
2. Weight:
3. Lanugo:
4. Scalp Hair:
5. Eyes:
6. Pupillary Membrane:
7. Nails:
8. Vernix Caseosa:
9. Umbilicus:
   position & status
10. Genitalia:
11. Any other finding:

II. Internal Examination:

1. Ossification centres:
2. Meconium:
3. Any other findings:

Opinion about the age of foetus: _____

_____

_____

_____

_____

Place:
Date and Time:

Signature
Name of Doctor _____
Designation _____

Receipt: Received original copy of the report, the new-born,
_____ & its belongings. Name & Signature of I.O.

Table: Age-related Changes in the Foetus

Parameter	Age in Lunar Months							
	3rd	4th	5th	6th	7th	8th	9th	10th
Length	About 9 cm	About 16 cm	About 25 cm	About 30 cm	About 35 cm	About 40 cm	About 45 cm	About 45-50 cm
Weight	About 30gm	About 120gm	About 400gm	About 700gm	About 1kg	About 1.5kg	About 2-2.5kg	About 3-3.5kg
Nails	In membra-nous form	-	Nearing tips of fingers	-	Thicker but do not reach ends of fingers	Reach tips of fingers	Beyond tips of fingers	Beyond tips of fingers but reach only the tips of toes
Lanugo	-	First exhibited between 13 and 16 weeks	Covers face and body	-	Greatest between 28 and 30 weeks	Dis-appeared from the face	Around shoulders only	-
Scalp Hair	-	-	Appear	Appreciable	About 1.0 cm long	About 1.5 cm long	About 2 cm long	About 2-3 cm long
Sex	Indisting uishable	Differen-tiable	-	-	-	-	-	-
Eyes	-	-	-	Eyelids adherent. Eyelashes Appear	Eyelids non–adherent. Eyelashes Present	Well–Formed	-	-
Pupil Membrane	Appears	Visible	Present	Present	Disappears	-	-	-
Vernix Caseosa	-	-	Appears	Present	-	-	Present over flexures of joints and neck folds	Present over flexures of joints and neck folds
Meconium	-	In the upper part of small intestine	In the beginning of large intestine	In the upper part of large intestine	In the whole of large intestine	-	In the Rectum	-
Testicles	-	-	-	Lie close to respective kidneys	Lt—near the external inguinal ring; Rt—near the internal inguinal ring	Lt—in the scrotum Rt—near the external inguinal ring	Both testicles in the scrotum	
Centres of ossification	-	-	For calcaneum and ischium	For manubrium & 1st segment of sternum	For talus, 2nd & 3rd segment of sternum	-	For lower end of femur	For cuboid upper end of tibia, etc.

04. Medical Certificate of Cause of Death (MCCD)

The data on cause of death contained in the certificate serve many purposes: they help in assessing the effectiveness of public health programmes and provide a feed-back for future policy and implementation. They are essential for better health planning and management and for deciding priorities of health and medical research programmes.

- Legal Provisions: Registration of Birth & Deaths Act (RBD), 1969 for certification by a medical practitioner who has attended the deceased during the latter's last illness. The relevant sections of the Act are: **Section 10(2)**, **Section 10(3), Section 17(1) (b)**

2. SPECIFIC INSTRUCTIONS

2.1 Name of the deceased

To be given in full. Do not use initials. Also give name of father (or husband in case of married female) after the name of the deceased, using appellation S/o or D/o or W/o. In case of infants not yet named, write son (or daughter) of, followed by names of mother and father.

2.2 Age

If more than a year old, give age in years last birthday (completed number of years). If under one year, give age in months and days. If under 24 hours, give in hours and minutes. 2.3 Method of certification of cause of death 2.3.1 The medical part of the certificate is designed by the WHO to facilitate reporting the underlying cause of death and to obtain information of the causal and pathological sequence of events leading to death. It consists of two parts, the first relating to the sequence of events leading to death, and the second to other significant conditions that contributed to the death.

2.3.2 This part should be written by the attending physician or a physician having personal knowledge of the case history. The names of the diseases should be written in full and legibly to avoid the risk of their being misread. Abbreviations and short form of disease condition should not be used. He should avoid indefinite or inadequate terms. Inadequate descriptions may put the statistical office in difficulty at the time of classification of the data. Mention of terminal events or mode of dying as the only entry in the statement leaves the certificate incomplete. Similarly, symptomatic remarks will not suffice. A properly completed certificate will show the underlying cause on the lowest used line of part I and the conditions if any, as a consequence thereof will have been entered above it in ascending casual order of sequence.

2.3.3 PART – I OF THE CAUSE OF DEATH STATEMENT

Only one cause is to be entered on each line of Part I. The underlying cause of death should be entered on the lowest line used in this part. The underlying cause of death is the condition that started the sequence of events between normal health and the (direct) immediate cause of death.

Line (a): Immediate cause

The direct or immediate cause of death is reported on line (a). This is the disease, injury or complication that directly preceded death. It can be the sole entry in the statement if only one condition was present at death. There must always be an entry on line (a). The mode of dying (e.g., heart failure, respiratory failure) should not be stated at all since it is no more than a symptom of the fact that death occurred and provides no useful information. In the case of a violent death, enter the result of the external cause (e.g., fracture of vault or skull, crushed chest).

Line (b): Due to (or as a consequence of) If the condition on line (a) was the consequence of another condition, record that in line (b). This condition must be antecedent to the immediate cause of death, both with respect to time and etiological or pathological violence or circumstances of accident is antecedent to an injury entered on line (a) and should be entered on line (b), although the two events are almost simultaneous (e.g., automobile accident, fall from tree). An antecedent condition might have just prepared the way for the immediate cause of death, by damage to tissues or impairment of function, even after a long interval.

Line (c): The condition, if any which gave rise to the antecedent condition on line (b) is to be reported here. The remarks given for line (b) apply here also. If the condition on line (b) is the underlying cause, nothing more be entered on this line. However, if the sequence of events comprises more than three stages, extra line (and entries) may be made in part I. However, many conditions are involved; write the full sequence, one condition per line, with the most recent condition (immediate cause) at the top, and the earliest (the condition that started the sequence of event between normal health and death) last. Normally the condition or circumstance on the lowest line used in part I will be taken as the basis for underlying cause statistics, though classification of it may be modified to take account of complications or other conditions entered by special provisions of the ICD.

2.3.4 PART-II OTHER SIGNIFICANT CONDITIONS

Enter, in order of significance, all other diseases or conditions believed to have unfavourably influenced the course of the morbid process and thus contributed to the total outcome but which were not related to the disease or condition directly causing death. There will be cases where it will be difficult to decide whether a condition relevant to death should be recorded as part of the fatal sequence in part I or as a contributory condition in part II. Conditions in part I should represent a distinct sequence so that each condition may be regarded as being the consequence of the condition entered immediately below it. Where a condition does not seem to fit into such a sequence, consider whether it belongs to part II. In certifying the causes of death for Part II, any disease, abnormality, injury or late effects of poisoning, believed to have adversely affected the decedent should be reported, including: • Use of alcohol and/or other substances. • Smoking history. • Environmental factors, such as exposure to toxic fumes, history of working in some specific industry, professional exposure to toxins, specific animals etc. • Recent pregnancy, if believed to have contributed to the death. • Late effects of injury, including head injury sequelae • Surgical information, if applicable. • Any iatrogenic underlying cause.

2.3.5 INTERVAL BETWEEN ONSET AND DEATH

Space is provided, against each condition recorded on the certificate for the interval between the presumed onset of morbid condition and the date of death. Exact period should be written when it is known; in other cases, approximate periods like “from birth”, “several years” or “unknown” should be indicated. This provides a useful check on the sequence of causes as well as useful information about the duration of illness in certain diseases.

2.4 Accidents or suicide or homicide is ruled out, how the fatal injury occurred should be explained indicating briefly the circumstances or cause of the accident. In case of medico-legal cases, the certificate has to be given by the police authorities. However, the Registrar should be informed of such cases, by the hospital.

2.5 Female death Information on pregnancy and delivery is needed in case of death of women in the childbearing age (15 to 49 years) even though the pregnancy may have had nothing to do with the death. 2.6 Ensuring completeness of information

2.6.1 While giving the casual chain of events in the statement of cause of death, a complete case history is not required but, if information is available, enough details may be given to enable proper classification of the underlying cause. The certifier cannot always be certain as to what details are required and therefore, a list giving examples of incomplete descriptions and what additional information are required is included in the annexure for guidance.

The terms included in the annexure are those employed usually and are of the following types: - (i) A symptom that may arise from different group of diseases. (ii) A morbid condition that could result from several types of infection, known or unknown. (iii) With connotation of any of several morbid conditions having distinctive categories in the classification list like acute, sub-acute, chronic, simple etc. (iv) Mention of a disease which is generally localised, without indicating the organ or part of the body affected. (v) A morbid condition that requires for its classification, a knowledge of the circumstances in which it arose.

2.6.2 As a general rule, record diagnoses as precisely as the information permits, incorporating relevant details from histological or autopsy reports. Where an important detail is unknown the fact should be stated.

2.6.3 The following gives the pertinent details required to be spelt out in the medical part of the certificate corresponding to the major cause group of mortality;

1. Infections: Acute, sub-acute or chronic, name of the disease and/or infecting organism, the site if localised; mode of transmission, where relevant.
2. Neoplasms: The morphological type if known; malignant, benign etc., site of origin of primary growth and sites of secondary growths.
3. Endocrine disorders: Nature of disease process or disturbance of function: For thyroid diseases, whether toxic: for diabetes, nature of complication or manifestation in particular site.
4. Nutritional disorders: Type of deficiency, etc., and severity.
5. Blood disorders: Nature of disease process; type and nature of any deficiency for anaemias; whether hereditary (where relevant)
6. Nervous system disorders: Disease process; infecting organism (where relevant) whether hereditary (where relevant).
7. Circulatory diseases: Nature of disease process; site, if localized; acute or chronic where relevant, specify rheumatic or other aetiology for valvular heart conditions; any complications.
8. Respiratory diseased: Nature of disease process; acute or chronic; infecting organism, any external cause.
9. Digestive diseased: Nature of disease process; site of ulcers, hernias, diverticula, etc. Acute or chronic where relevant, nature of any complication for ulcers, appendicitis, hernias.
10. Genitourinary disorders: Acute or chronic, clinical syndrome and pathological lesions; site of calculi, infecting organism and site of infections; nature of complications.
11. Maternal deaths: Nature of complication: whether obstruction occurred during labour; timing of death in relation to delivery; for abortions, whether spontaneous or induced, legal or illegal, if induced.
12. Musculoskeletal disorders: Nature of disease process, infecting organism, underlying systemic diseases (where relevant); site; complication, whether congenital or acquired for deformities.
13. Congenital anomalies: Site and type, complications.

14. Perinatal deaths: Condition in foetus or infant; conditions in mother or of placenta, cord or membranes, if believed to have affected the foetus or infant; for deaths associated with immaturity, state length of gestation and/or birth weight; type of birth trauma; and complications, etc.
15. Injuries: Type, site, complications.
16. Poisoning: Substance involved; whether accidental (if suicide or homicide is ruled out). 17. Adverse effects of drugs in therapeutic use: State this fact and name or drug, nature of adverse effect, complications; condition treated.
17. External cause of accidents: For transport accidents, state vehicle involved, whether deceased was driver, passenger, etc. Description of accident place of occurrence, for other accidents, specifies circumstances and place of occurrence.
18. Old age or senility: This should not be given if a more specific cause is known. If old age was a contributory factor it should be entered in part II only.

ICD classification of diseases

The International Classification of Diseases (ICD) is the standard classification system for epidemiology, health management and clinical purposes. It contains a finite number of mutually exclusive code categories, describing all disease conditions. The classification is hierarchical in structure with subdivisions to identify broad groups and specific entities.

There are 3 key elements to the structure of ICD-10:

1. It has 3 volumes
    i. Volume 1 -- a tabular listing of diseases
    ii. Volume 2 -- an instruction manual
    iii. Volume 3 -- the comprehensive alphabetical index of diseases
2. It has 22 chapters
3. The structure of the ICD code is alphanumeric

Filling ICD code on a death certificate

The ICD code should be coded for all causes of death (immediate, intermediate and underlying causes) on a death certificate. ICD code for each cause of death should be filled against the particular cause of death in the death certificate.

Example: Patient XYZ is admitted with Acute Gastroenteritis and Dehydration & then dies in the ward.

Name of the Deceased					For use of Statistical office
Sex	Age at Death: If 1 year or more, age in years	If less than 1 year, age in Months	If less than one month, age in days	If less than one day, age in hours	
1. Male 2.Female 3.Transgender					
CAUSE OF DEATH				Interval between on set & death approx	
I					
Immediate Cause	(a) **Dehydration**				**E86**
State the disease, injury or complication which caused death, not the mode of dying such as heart failure, asthenia, etc...	Due to (or consequences of)			.....	.....
	Acute Gastroenteritis				**A09**
Antecedent Cause	(b).....			.....	.....
Morbid conditions, if any, giving rise To the above Cause, stating underlying conditions last	Due to (or consequences of) (c).....				
II					
Other significant conditions contributing to the death but not related to the disease or conditions causing it	....			....	....

ANNEXURE-II
For **Hospital Events**

FORM NO. 4
(*See Rule 7*)

MEDICAL CERTIFICATE OF CAUSE OF DEATH
(Hospital In-patients. Not to be used for still births)

To be sent to Registrar along with Form No. 2 (Death Report)

Name of the Hospital _____
I hereby certify that the person whose particulars are given below died in the hospital in Ward No._____ On_____ At _____ AM/PM.

Name of the deceased					For use of statistical purpose
Sex	Age at death				
	If 1 year or more, age in years	If less than 1 year, age in month	If less than one month, age in days	If less than one day, age in hours	
1, Male 2.Female					
CAUSE OF DEATH				Interval between onset and death approx.	
I. Immediate cause: State the disease, injury or complication which caused death, not the mode of dying such as heart failure, asthenia, etc.	a) ……..… due to (or as a consequence of)				
Antecedent cause: Morbid conditions, if any, giving rise to the above cause, stating the underlying conditions last.	b) …… due to (or as a consequence of)				
II. Other significant conditions contributing to the death, but not related to the diseases or conditions causing it.	c) …… …… ……				

Manner of Death How did the injury occur?
1. Disease 2. Accident 3. Assault 4. Intentional self-harm 5. Legal intervention 6. War
7. Pending investigation 8. Could not be determined.

If deceased was a female, was pregnancy the death associated with? 1. Yes 2. No
If yes, was there a delivery? 1. Yes 2. No

Name and signature of the Medical Attendant certifying the cause of death
Date of verification _____

(*To be detached and handed over to the relative of the deceased*)

Certified that Shri/Smt/Kum_____S/W/D of Shri _____
R/O _____ was admitted to this hospital on _____
and expired on _____.

Doctor_____
(Medical Superintendent & Name of Hospital)

ANNEXURE-II

For **Hospital Events**

FORM NO. 4

(*See Rule 7*)

MEDICAL CERTIFICATE OF CAUSE OF DEATH

(Hospital In-patients. Not to be used for still births)

To be sent to Registrar along with Form No. 2 (Death Report)

Name of the Hospital _____

I hereby certify that the person whose particulars are given below died in the hospital in Ward No._____ On_____ At _____ AM/PM.

<table>
<tr><td colspan="5">Name of the deceased</td><td rowspan="2">For use of statistical purpose</td></tr>
<tr><td>Sex</td><td colspan="4">Age at death</td></tr>
<tr><td></td><td>If 1 year or more, age in years</td><td>If less than 1 year, age in month</td><td>If less than one month, age in days</td><td>If less than one day, age in hours</td><td></td></tr>
<tr><td>1, Male
2.Female</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="4">CAUSE OF DEATH

I. Immediate cause:
State the disease, injury or complication
which caused death, not the mode of dying
such as heart failure, asthenia, etc.
a) …… …
due to (or as a consequence of)

Antecedent cause:
Morbid conditions, if any, giving rise to the above cause, stating the underlying conditions last.
b) ……
due to (or as a consequence of)

II. Other significant conditions contributing to the death, but not related to the diseases or conditions causing it.
c) ……
……
……</td><td colspan="2">Interval between onset and death approx.</td><td></td></tr>
</table>

Manner of Death — How did the injury occur?

1. Disease 2. Accident 3. Assault 4. Intentional self-harm 5. Legal intervention. 6. War
7. Pending investigation 8. Could not be determined.

If deceased was a female, was pregnancy the death associated with? 1. Yes 2. No

If yes, was there a delivery? 1. Yes 2. No

Name and signature of the Medical Attendant certifying the cause of death

Date of verification _____

(To be detached and handed over to the relative of the deceased)

Certified that Shri/Smt/Kum_____S/W/D of Shri _____

R/O _____ was admitted to this hospital on _____

and expired on _____.

Doctor_____

(Medical Superintendent & Name of Hospital)

For **Non-Hospital** Events

FORM NO. 4 A

(*See Rule 7*)

MEDICAL CERTIFICATE OF CAUSE OF DEATH

(For non-institutional deaths. Not to be used for still births)

To be sent to Registrar along with Form No. 2 (Death Report)

Name of the Hospital_____

I hereby certify that the person whose particulars are given below died in the hospital in Ward No._____ On_____ At _____AM/PM.

<table>
<tr><td colspan="5">Name of the deceased</td><td rowspan="2">For use of statistical purpose</td></tr>
<tr><td>Sex</td><td colspan="4">Age at death</td></tr>
<tr><td></td><td>If 1 year or more, age in years</td><td>If less than 1 year, age in month</td><td>If less than one month, age in days</td><td>If less than one day, age in hours</td><td></td></tr>
<tr><td>1, Male
2.Female</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="4">CAUSE OF DEATH

I. Immediate cause:
State the disease, injury or complication
which caused death, not the mode of dying
such as heart failure, asthenia, etc.
a) …… …
due to (or as a consequence of)

Antecedent cause:
Morbid conditions, if any, giving rise to the above cause, stating the underlying conditions last.
b) ……
due to (or as a consequence of)

II. Other significant conditions contributing to the death, but not related to the diseases or conditions causing it.
c) ……
……
……</td><td>Interval between onset and death approx.</td><td></td></tr>
</table>

If deceased was a female, was pregnancy the death associated with? 1. Yes 2. No

If yes, was there a delivery? 1. Yes 2. No

Name and signature of the Medical Attendant certifying the cause of death

Date of verification_____

(To be detached and handed over to the relative of the deceased)

Certified that Shri/Smt/Kum _____ S/W/D of Shri _____

R/O_____ was under my treatment from _____ to _____

and expired on _____at _____ AM/PM.

Doctor _____

Signature and address of Medical Practitioner/

Medical attendant with Registration No.

For **Non-Hospital** Events

FORM NO. 4 A

(*See Rule 7*)

MEDICAL CERTIFICATE OF CAUSE OF DEATH

(For non-institutional deaths. Not to be used for still births)

To be sent to Registrar along with Form No. 2 (Death Report)

Name of the Hospital_____ I hereby certify that the person whose particulars are given below died in the hospital in Ward No._____ On_____ At _____AM/PM.

<table>
<tr><td colspan="5">Name of the deceased</td><td rowspan="2">For use of statistical purpose</td></tr>
<tr><td>Sex</td><td colspan="4">Age at death</td></tr>
<tr><td></td><td>If 1 year or more, age in years</td><td>If less than 1 year, age in month</td><td>If less than one month, age in days</td><td>If less than one day, age in hours</td><td></td></tr>
<tr><td>1, Male
2.Female</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="4">CAUSE OF DEATH

I. Immediate cause:
State the disease, injury or complication
which caused death, not the mode of dying
such as heart failure, asthenia, etc. a) …… …
due to (or as a consequence of)

Antecedent cause:
Morbid conditions, if any, giving rise to the above cause, stating the underlying conditions last. b) ……
due to (or as a consequence of)

II. Other significant conditions contributing to the death, but not related to the diseases or conditions causing it. c) ……
……
……</td><td>Interval between onset and death approx.</td><td></td></tr>
</table>

If deceased was a female, was pregnancy the death associated with? 1. Yes 2. No

If yes, was there a delivery? 1. Yes 2. No

Name and signature of the Medical Attendant certifying the cause of death

Date of verification_____

(To be detached and handed over to the relative of the deceased)

Certified that Shri/Smt/Kum _____ S/W/D of Shri _____

R/O_____ was under my treatment from _____ to _____

and expired on _____at _____ AM/PM.

Doctor _____

Signature and address of Medical Practitioner/

Medical attendant with Registration No.

05. Medical Sickness / Under Treatment Certificate

Recent Passport size photo

Name of Patient: _____

Age: _____ Sex : _____

Address : _____

OPD/IPD No._____

ID Proof & No. (Any Govt ID) : _____

Identification Marks:

1. _____

_____

2. _____

_____

Signature & Thumb Impression of the Applicant: _____

I, Dr_____ after careful personal examination of the case hereby certify that _____ whose signature is given above is suffering from _____.

He/she is under my treatment for the same as outdoor/indoor patient and I consider that a period of absence from duty with effect from _____ to _____ (_____Days) is absolutely necessary for the restoration of his/her health.

Place:

Date and Time:

Signature

Name of Doctor _____

Designation _____

06. Medical Fitness Certificate

Recent Passport size photo

Name of Patient: _____

Age: _____ Sex: _____

Address: _____

OPD/IPD No._____

ID Proof & No. (Any Govt ID) : _____

Identification Marks:

1. _____

_____

2. _____

_____

Signature & Thumb Impression of the Applicant: _____

I, Dr _____ after careful personal examination of the case hereby certify that _____ on restoration of his/her health is now fit to resume service from _____.

Place:

Date and Time:

Signature

Name of Doctor _____

Designation _____

07. Fitness Certificate for Employment

Recent Passport size photo

We hereby certify that, we have examined Shri/Smt. _____ a candidate for employment in the _____ Department and cannot discover that he/she has any disease, constitutional weakness or bodily infirmity except _____ _____ _____.

Fit:

*He / She is Temp. Unfit:

Unfit:

We do not consider this is a disqualification for employment in the Office of _____ _____. His / Her age is according to his/her own statement _____ years and by appearance about _____ years.

Identification Marks:

1. _____ _____

2. _____ _____

Signature/Thumb impression of the Candidate

Place: _____

Date: _____

Member	Member	Chairman
Medical Board	Medical Board	Medical Board

08. Examination \ Certificate of the injured (Injury Report)

1. Medico-legal injury cases should be examined without delay after adopting the lifesaving procedure.
2. Valid consent for examination must be obtained from the injured or the competent authority.
3. All observation should be entered at once in the accident register with appropriate sketches and diagrams. Injury should be photographed whenever possible.
4. Relevant information should always be entered in injury certificate or report and be prepared in duplicate.
5. Whenever there is apprehension of death of the injured person *or* he is likely to die from the effect of the injury, arrangement should be made for recording dying declaration.

Definitions:

Injury: Legal definition as per sec. 44 IPC.

Hurt: Legal definition as per sec. 319 IPC.

Simple injury:

Grievous hurt: Legal definition as per sec. 320 IPC.

Examination / Certification of Injured. [Injury Report]

To,
The Investigating Officer,
_____ Police Station _____

Subject: Submission of report of examination of injured person
Reference: Your letter No. _____ Dated _____

Sir,

I am forwarding herewith the report of examination of:

Name of Injured: _____ Son/Wife/Daughter/Widow of _____
Surname _____ resident of _____
Brought by PC _____NO._____P.S. _____

Consent:

(*This consent is explained to patient in* _____*language*). Signature/LTI
Examined in presence of- (Subject/Guardian)
Signature/Thumb impression-
Identification marks: 1. _____
2. _____

History: History narrated by_____

Sr. No.	Nature of injury	Size in cms	Situation over the body	Type of injury	Possible/ Kind of weapon	Age of injury	Remarks / Investigation done, *if any*

Opinion:

Place:
Date and Time:

Signature
Name of Doctor _____
Designation _____

To,
The Investigating Officer,
_____ Police Station _____

Subject: Submission of report of examination of injured person
Reference: Your letter No. _____ Dated _____

Sir,

I am forwarding herewith the report of examination of:

Name of Injured: _____ Son/Wife/Daughter/Widow of _____
Surname _____ resident of _____
Brought by PC _____NO._____P.S. _____

Consent:

(*This consent is explained to patient in* _____*language*). Signature/LTI
Examined in presence of- (Subject/Guardian)
Signature/Thumb impression-
Identification marks: 1. _____
2. _____

History: History narrated by_____

Sr. No.	Nature of injury	Size in cms	Situation over the body	Type of injury	Possible/ Kind of weapon	Age of injury	Remarks / Investigation done, *if any*

Opinion:

Place:
Date and Time:

Signature
Name of Doctor _____
Designation _____

To,
The Investigating Officer,
_____ Police Station _____

Subject: Submission of report of examination of injured person
Reference: Your letter No. _____ Dated _____

Sir,

I am forwarding herewith the report of examination of:

Name of Injured: _____ Son/Wife/Daughter/Widow of _____
Surname _____ resident of _____
Brought by PC _____NO._____P.S. _____

Consent:

(*This consent is explained to patient in* _____*language*). Signature/LTI
Examined in presence of- (Subject/Guardian)
Signature/Thumb impression-
Identification marks: 1. _____
2. _____

History: History narrated by_____

Sr. No.	Nature of injury	Size in cms	Situation over the body	Type of injury	Possible/ Kind of weapon	Age of injury	Remarks / Investigation done, *if any*

Opinion:

Place:
Date and Time:

Signature
Name of Doctor _____
Designation _____

To,
The Investigating Officer,
_____ Police Station _____

Subject: Submission of report of examination of injured person
Reference: Your letter No. _____ Dated _____

Sir,

I am forwarding herewith the report of examination of:

Name of Injured: _____ Son/Wife/Daughter/Widow of _____
Surname _____ resident of _____
Brought by PC _____NO._____P.S. _____

Consent:

(*This consent is explained to patient in* _____*language*). Signature/LTI
Examined in presence of- (Subject/Guardian)
Signature/Thumb impression-
Identification marks: 1. _____
2. _____

History: History narrated by_____

Sr. No.	Nature of injury	Size in cms	Situation over the body	Type of injury	Possible/ Kind of weapon	Age of injury	Remarks / Investigation done, *if any*

Opinion:

Place:
Date and Time:

Signature
Name of Doctor _____
Designation _____

To,
The Investigating Officer,
_____ Police Station _____

Subject: Submission of report of examination of injured person
Reference: Your letter No. _____ Dated _____

Sir,

I am forwarding herewith the report of examination of:

Name of Injured: _____ Son/Wife/Daughter/Widow of _____
Surname _____ resident of _____
Brought by PC _____NO._____P.S. _____

Consent:

(*This consent is explained to patient in* _____*language*). Signature/LTI
Examined in presence of- (Subject/Guardian)
Signature/Thumb impression-
Identification marks: 1. _____
2. _____

History: History narrated by_____

Sr. No.	Nature of injury	Size in cms	Situation over the body	Type of injury	Possible/ Kind of weapon	Age of injury	Remarks / Investigation done, *if any*

Opinion:

Place:
Date and Time:

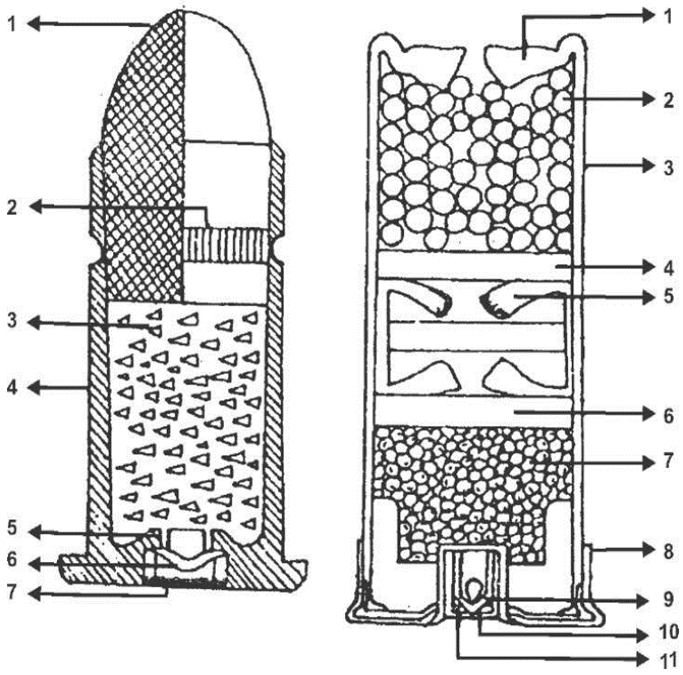
Signature
Name of Doctor _____
Designation _____

09. Examination of Weapon

Definition:

Dangerous Weapon as per sec 324 & 326 IPC.:

Label various parts of ammunition of fire arm.



Draw & label Weapon	Describe Weapon
	Kind of Weapon- Type of Weapon- Injuries Possible-
	Kind of Weapon- Type of Weapon- Injuries Possible-
	Kind of Weapon- Type of Weapon- Injuries Possible-
	Kind of Weapon- Type of Weapon- Injuries Possible-

Draw & label Weapon	Describe Weapon
	Kind of Weapon- **Type of Weapon-** **Injuries Possible-**
	Kind of Weapon- **Type of Weapon-** **Injuries Possible-**
	Kind of Weapon- **Type of Weapon-** **Injuries Possible-**
	Kind of Weapon- **Type of Weapon-** **Injuries Possible-**

Draw & label Weapon	Describe Weapon
	Kind of Weapon- Type of Weapon- Injuries Possible-
	Kind of Weapon- Type of Weapon- Injuries Possible-
	Kind of Weapon- Type of Weapon- Injuries Possible-
	Kind of Weapon- Type of Weapon- Injuries Possible-

1) Examination of the Weapon in Cases of Injuries (Sharp Edge Weapon)

To,
The Investigating Officer

_____Police Station _____

Sub: Submission of report of examination of weapon in connection with _____
_____

Reference:
1) Your letter No._____ Dated _____ with sealed packed weapon.

2) Injury Report / MLPM No.: _____ issued by _____Date: _____

Sir,

With reference to the above letter, I am sending the report about the weapon sent in sealed condition in connection with the injuries of _____

Name of weapon _____

Kind of weapon _____

Type of weapon _____

Description of the weapon:

Weight of weapon: _____(gm)

Total length of weapon: _____(cms)

Blade: is of _____, Texture: _____

Length: _____, Breadth: _____, Thickness: _____

Edges / Margins: _____ Point: _____

Stains / Foreign body if any: _____

Joint: Type: _____, Hilt: Size: _____

Handle: is of, _____ Texture: _____

Length: _____ , Breadth/ Maximum Circumference: _____

Stains / Foreign body if any: _____

Opinion:

Injuries possible by above weapon:

Identification marks if any on the weapon.
(*Put the signature on the weapon*)

The weapon was packed, sealed and handed over to _____of police station_____ for forwarding to FSL for chemical analysis.

Place: _____ Signature
Date & Time: _____ (Impression of seal) Name of Doctor _____
Receipt of weapon and report Designation _____

2) Examination of the Weapon in Cases of Injuries (Hard & Blunt weapon)

To,
The Investigating Officer

_____Police Station _____

Sub: Submission of report of examination of weapon in connection with _____
_____

Reference:
1) Your letter No._____ Dated _____ with sealed packed weapon.

2) Injury Report / MLPM No.: _____ issued by _____Date: _____

Sir,

With reference to the above letter, I am sending the report about the weapon sent in sealed condition in connection with the injuries of _____

Name of weapon: _____

Kind of weapon: _____

Type of weapon: _____

Description of the weapon:

Weight of weapon: _____(gm)

Length: _____Breadth / Maximum circumference: _____

Thickness: _____

Surface: _____

Texture: _____

Stains / Foreign body if any: _____

Opinion:

Injuries possible by above weapon:

Identification marks if any on the weapon.
(*Put the signature on the weapon*)

The weapon was packed, sealed and handed over to _____of police station_____ for forwarding to FSL for chemical analysis.

Place: _____ Signature
Date & Time: _____ (Impression of seal) Name of Doctor _____
Receipt of weapon and report Designation _____

10. Medico-legal Examination of Survivors / Victims of Sexual Violence

Definition of Rape:

CONFIDENTIAL

Medico-legal Examination Report of Sexual Violence

1. Name of the Hospital _____ OPD No. _____ Inpatient No. _____
2. Name _____ D/o or S/o (where known) _____
3. Address _____
4. Age (as reported) _____ Date of Birth (if known) _____
5. Sex (M/F/Others) _____
6. Date and Time of arrival in the hospital _____
7. Date and Time of commencement of examination _____
8. Brought by_____ (Name & signatures)
9. MLC No. _____Police Station_____
10. Whether conscious, oriented in time and place and person _____
11. Any physical/intellectual/psychosocial disability _____

(Interpreters or special educators will be needed where the survivor has special needs such as hearing/speech disability, language barriers, intellectual or psychosocial disability.)

12. Informed Consent/refusal

I_____D/o or S/o _____

hereby give my consent for:

a) Medical examination for treatment Yes/No

b) This medico-legal examination Yes/No

c) Sample collection for clinical & forensic examination Yes/No

I also understand that as per law the hospital is required to inform police and this has been explained to me. I want the information to be revealed to the police Yes/No

I have understood the purpose and the procedure of the examination including the risk and benefit, explained to me by the examining doctor. My right to refuse the examination at any stage and the consequence of such refusal, including that my medical treatment will not be affected by my refusal, has also been explained and may be recorded. Contents of the above have been explained to me in_____ language with the help of a special educator/interpreter/support person (circle as appropriate) _____.

If special educator/interpreter/support person has helped, then his/her name and signature_____

Name & signature/thumb impression of Witness

_____

_____

With Date, time and place

Name & signature of survivor or parent/Guardian/person in whom the child reposes trust in case of child (<12 yrs)

_____

_____

With Date, time and place

13. Marks of identification (Any scar/mole):

(1) _____

_____

(2) _____

_____

Left Thumb impression

14. Relevant Medical/Surgical history

Onset of menarche (in case of girls) – Yes/No Age of onset _____
Menstrual history – Cycle length and duration _____Last menstrual period_____
Menstruation at the time of incident -Yes/No, Menstruation at the time of examination - Yes/ No
Was the survivor pregnant at time of incident - Yes/No, If yes duration of pregnancy _____ weeks
Contraception use: Yes/No_____ If yes – method used:_____
Vaccination status – Tetanus (vaccinated/not vaccinated), Hepatitis B (vaccinated/not vaccinated)

15A. History of Sexual Violence

(i)Date of incidents being reported (ii)Time of incidents/s (iii)Location/s
(iv)Estimated duration: 1-7 days_____ 1 week to 2 months _____2-6 months _____ >6 months_____ Episode: One _____ Multiple _____Chronic (>6 months) _____ Unknown _____
(v) Number of assailants and name/s _____ (vi)Sex of Assailant(s) _____ Approx. Age of assailant (s) _____ If known to the survivor- relationship with the survivor _____
(vii) Description of incident in the words of the narrator: narrator of the incident: Survivor/informant(specify name and relation to survivor)_____ _____ _____

15C.

i. Emotional abuse or violence if any (insulting, cursing, belittling, terrorizing) _____
ii. Use of restraints if any _____
iii. Used or threatened the use of weapon(s) or objects if any_____
iv. Verbal threats (for example, threats of killing or hurting survivor or any other person in whom the survivor is interested; use of photographs for blackmailing, etc.) if any: _____
_____
v. Luring (sweets, chocolates, money, job) if any _____
vi. Any other: _____

15D.

i. Any H/O drug/alcohol intoxication: _____
ii. Whether sleeping or unconscious at the time of incident: _____

15E. If survivor has left any marks of injury on assailant/s, enter details: _____

15F. Details regarding sexual violence:

Was penetration by penis, fingers or object or other body parts (Write Y=Yes, N=No, DNK=Don't know) Mention and describe body part/s and/or object/s used for penetration.

	Penetration			Emission of semen		
Orifice of victim	By penis	By body part of self or assailant or third-party finger, tongue or any other)	By object	Yes	No	Don't know
Genitalia (vagina and/ or urethra)						
Anus						
Mouth						

Oral sex performed by assailant on survivor	Y	N	DNK
Forced masturbation of self by survivor	Y	N	DNK
Masturbation of assailant by survivor, forced manipulation of genitals of assailant by survivor	Y	N	DNK
Exhibitionism (perpetrator displaying genitals)	Y	N	DNK
Did ejaculation occur outside body orifice (Vagina/anus/mouth/urethra)?	Y	N	DNK
If yes, describe where on body			
Kissing, licking or sucking any part of survivor's body	Y	N	If yes, describe
Touching/ fondling	Y	N	If yes, describe
Condom used*	Y	N	DNK
If yes, status of condom	Y	N	DNK
Lubricant used*	Y	N	DNK
If yes, describe kind of lubricant used			
If object used, describe object:			
Any other form of sexual violence			

*Explain what condom and lubricant is to the survivor

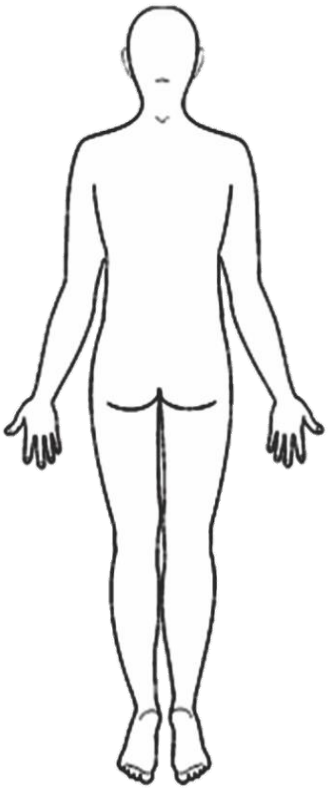
Post incident has the survivor	Yes/No/Do not know	Remarks
Changed clothes		
Changed undergarments		
Cleaned/washed clothes		
Cleaned/washed clothes undergarments		
Bathed		
Douched		
Passed urine		
Passed stools		
Rinsing of mouth/brushing/vomiting (circle any or all as appropriate)		

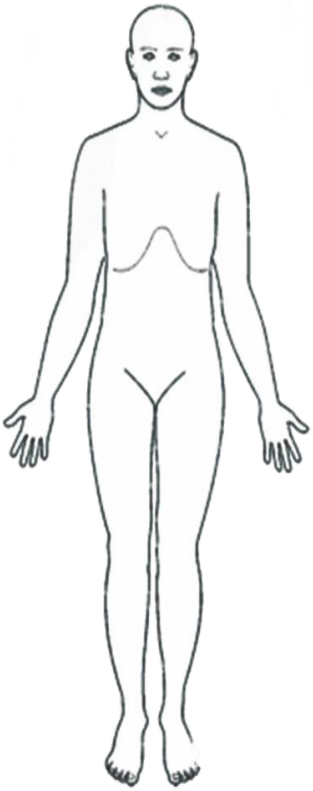
Time since incident _____
H/o vaginal/anal/oral bleeding/discharge prior to the incident of sexual violence _____
H/o vaginal/anal/oral bleeding/discharge since the incident of sexual violence _____
H/o painful urination/ painful defecation/ fissures/ abdominal pain/pain in genitals or any other part since the incident of sexual violence _____
_____
_____

16. General Physical Examination-
i. Is this the first examination _____
ii. Pulse _____ BP _____
iii. Temp _____Resp. Rate _____
iv. Pupils _____
v. Any observation in terms of general physical wellbeing of the survivor _____

17. Examination for injuries on the body if any
The pattern of injuries sustained during an incident of sexual violence may show considerable variation. This may range from complete absence of injuries (more frequently) to grievous injuries (very rare).
(Look for bruises, physical torture injuries, nail abrasions, teeth bite marks, cuts, lacerations, fracture, tenderness, any other injury, boils, lesions, discharge specially on the scalp, face, neck, shoulders, breast, wrists, forearms, medial aspect of upper arms, thighs and buttocks) Note the Injury type, site, size, shape, colour, swelling signs of healing simple/grievous, dimensions.)

Scalp examination for areas of tenderness, if hair pulled out/ dragged by hair)	
Facial bone injury: Orbital blackening, tenderness	
Petechial haemorrhages in eyes and other places	
Lips and Buccal mucosa/ gums	
Behind the ears	
Ear drum	
Neck, Shoulders and Breast	
Upper limb	
Inner aspect of upper arms	
Inner aspect of thighs	
Lower limb	
Buttocks	
Other, please specify	





18. Local examination of genital parts/other orifices*

A. External genitalia: record finding and state NA where not applicable.

Body parts to be examined	Findings
Urethral meatus and vestibule	
Labia majora	
Labia minora	
Fourchette and introitus	
Hymen	
Perineum	
External urethral meatus	
Penis	
Scrotum	
Testes	
Clitoropenis	
Labioscrotum	
Any other	

B. Per Vaginum /Per Speculum examination should not be done unless required for detection of injuries or for medical treatment.

P/S findings if performed _____

P/V findings if performed _____

Record reasons if P/V of P/S examination performed_____

C. Anus and Rectum (encircle the relevant)
Bleeding/tear/discharge/oedema/tenderness

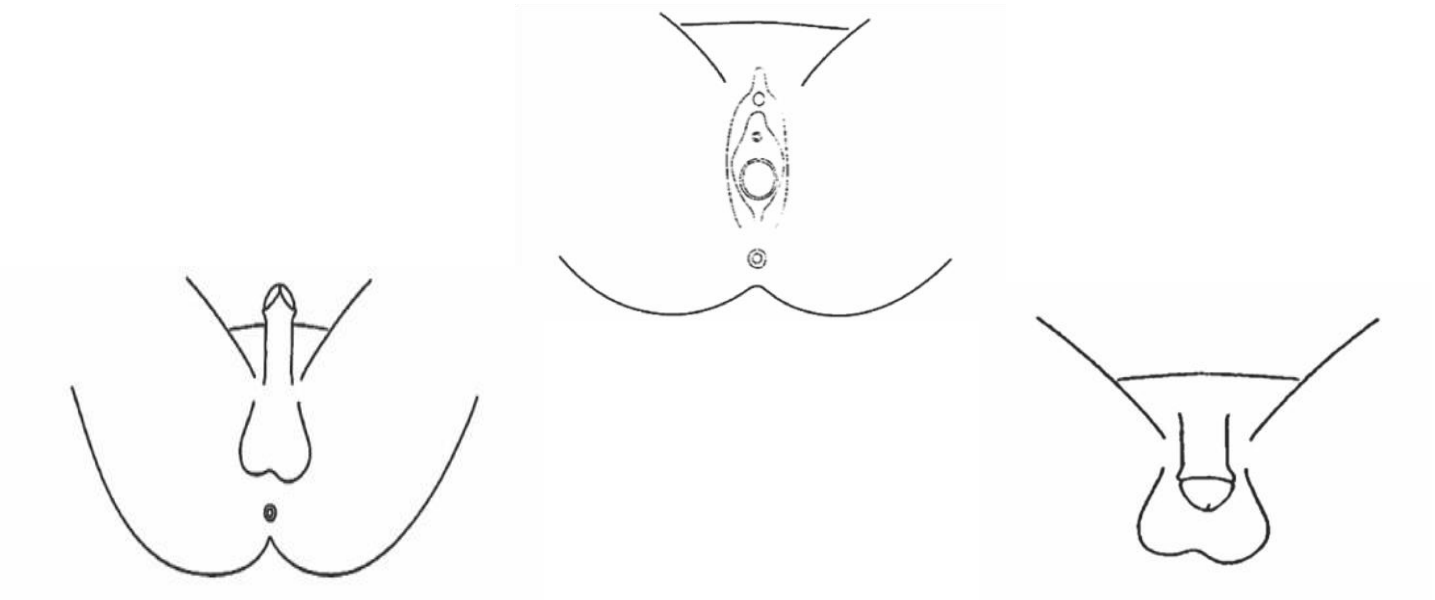
_____

_____

D. Oral Cavity - (encircle the relevant)
Bleeding/ discharge/ tear/oedema/ tenderness

_____

_____



19. Systemic examination:

1) Central Nervous System: _____

2) Cardio Vascular System: _____

3) Respiratory System: _____

4) Chest: _____

5) Abdomen: _____

20. Sample collected/ Investigations for hospital laboratory/ clinical laboratory:

1. Blood for HIV, VDRL, HbsAg _____

2. Urine test for pregnancy _____

3. Ultrasound for pregnancy/ internal injury _____

4. X-ray for injury _____

21. samples collection for central /state forensic laboratory.

1. Debris collection paper _____

2. Clothing evidence where available-(to be packed in separate paper bags after air drying)

List of Details of clothing worn by the survivor at time of incident of sexual violence

3. Body evidence samples as appropriate (duly labelled and packed separately)

	Collected/ Not collected	Reason for not collecting
Swabs from stains on the body (Blood, semen, foreign material, others)		
Scalp hairs (10-15 strands)		
Head hair combing		
Nail scrapings (Both hands separately)		
Nail clippings (Both hands separately)		
Oral swab		
Blood for grouping, testing drug/ alcohol intoxication (plain vial)		
Blood for alcohol levels (Sodium fluoride vial)		
Blood for DNA analysis (EDTA vial)		
Urine (drug testing)		
Any other (tampon/sanitary napkin/condom/object)		

4. Genital and anal evidence (each sample to be packed, sealed and labelled separately to be placed in bag).
***** swab sticks for collecting samples should be moistened with distilled water provided.

	Collected / Not collected	Reason for not collecting
Matted pubic hair		
Pubic hair combing (mention if shaved)		
Cutting of pubic hair (mention if shaved)		
Two vulval swabs (for semen examination and DNA testing)		
Two vaginal swabs (for semen examination and DNA testing)		
Two anal swabs (for semen examination and DNA testing)		
Vaginal smear (air-dried) for semen examination		
Vaginal washing		
Urethral swab		
Swab from glans penis/ clitoropenis		

*samples to be preserved as directed till handed over to police along with duly attested sample seal.

22. Provisional medical opinion:

I have examined (survivor) _____ M/F/other _____aged _____ reporting (type pf sexual violence and circumstances) _____ days/hours after incident, after having (bathed/douched) _____ my findings are as follows:

*samples collected (for FSL) awaiting reports _____

*samples collected (for hospital laboratory) _____

*clinical findings _____

*Additional observations (if any) _____

23. Treatment prescribed:

Treatment	Yes	No	Type and comments
STI prevention treatment			
Emergency contraception			
Wound treatment			
Tetanus prophylaxis			
Hepatitis B vaccination			
Post exposure prophylaxis for HIV			
Counselling			
Other			

24. Date and time of completion of examination _____

This report contains _____number of sheets and _____number of envelopes.

Place: _____ Signature of examining doctor/s_____

Date: _____ Name of examining doctor/s_____

Seal

25. **Final opinion**: (*After receiving lab reports)*

Findings in support of the above opinion, taking into account the history, clinical examination findings and laboratory reports of _____ bearing above identification marks described above _____ hours/days after the incident of sexual violence, I am opinion that: _____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Place: _____ Signature of examining doctor/s_____

Date: _____ Name of examining doctor/s_____

Seal

***copy of the entire report must be given to the survivor/ victim free of cost immediately.**

11. Examination of Accused of Sexual Violence

Name of Hospital:_ _____

OPD/ IPD No: _____ MLC No : _____ Date : _____

1. **Case Particulars:**
   Requisition from _____vide letter No. _____ Dated _____
   brought and identified by _____
2. **Particulars of the alleged accused:**
   i. Name: _____ S/o _____
   ii. Address: _____
   iii. Age as stated _____ iv. Occupation _____
   v. Married/Single/Divorcee _____ vi. Religion: _____
   vii. Marks of Identification:
   (a) _____(b) _____
   viii. Examined in presence of (name with signature) _____
3. **Consent given in writing**

I _____ _____ hereby voluntarily consent and agree to following
(Mark each that applies)

a) Medical examination and examination of genitals, examination of other secondary sexual characters and examination of other body parts.
b) Collection of samples for medical and Forensic examination and treatment.

All this has been explained to me in the manner and language, which I can understand

Left Thumb impression Signature of accused/ Guardian

Note: Age estimation is mandatory if the alleged accused is minor

4. **Brief History:**
   i. As given by police: _____
   _____
   _____
   ii. As given by alleged accused:

a. If he admits or denies the incidence(Account of incidence as per his statement)
b. Did he know the victim before? _____
c. Date and time of incidence: _____
d. Any history of S.T.D : YES / NO _____
e. Did he take bath, wash etc. after the alleged incidence? : YES / NO _____
f. Has he changed clothes after the incidence? : YES / NO _____
g. Condom used while sexual intercourse: YES / NO _____
h. Frequency and number of sexual intercourse: _____
i. Brief description of acts of penetration/ejaculation: _____
j. History of alcohol/other drug abuse: _____
k. Allergies: _____ Current medication: _____
l. Any Relevant Surgical history: _____
m. Any other: _____

5. Physical examination:

Clothing: If same was worn during the incidence look for presence of blood stains, semen, vaginal stain, female pubis hair, mud, grass, lipstick, any tear etc. and describe

_____

_____

_____

6. General examination:

Height: _____ Weight: _____ Body Built: _____

Blood Pressure: _____ Pulse: _____ RR: _____

Axillary hair: _____

Beard & Moustaches: _____

Pubic hair (including tanner staging) _____

Dentition: (8/8) _____

7. Systemic Examination

CNS : (Mental status) _____

CVS: _____ RS: _____

8 Marks of violence if any (Tick mark if present and describe):

Bite marks: _____

Abrasions: _____

Contusions: _____

Any other: _____

9. Genital Examination:

a. (Indicate as Y = Yes, N = No)

Observation	Pubic region	Thigh and adjoining part
Matted hair		
Seminal stain		
Blood		
Loose foreign hair		

b. Penis:

Observations	**Remark**
Development (Tanner Stage)	
Any defect/ Deformity	
Whether foreskin can be freely rolled up or is circumcised	
Evidence of any disease e.g. STD	
Presence of smegma under the foreskin	
Hair under prepuce	
Any stains nearby	

Injuries over Genital:

Prepuce: _____

Glans penis: _____

Frenulum: _____

Scrotum: _____

Any other: _____

10. Sample collection for Hospital/Clinical Laboratory

Sr No	Sample Name	Test For	Preservative/ Packing collected?	Yes/No
1.	Urethral Swab	Microscopy& Culture	Plain Sterile Bulb	
2.	Swab from discharge	Microscopy& Culture	Plain Sterile Bulb	
3.	Blood	Serology (For STD and Hep. B)	Plain Sterile Bulb	
4.	Urine (midstream)	Microscopy& Culture	Plain Sterile Bulb	

Note: *Every forensic examination room should have adjacent laboratory for detection of sperms and vaginal epithelium (Lugol's iodine test).*

11. Collection of Samples for Forensic Analysis:

a) Clothing, where available (Each garment to be wrapped separately and packed in paper bags after air drying) _____

_____

_____

b) **Sample collection for Forensic science laboratory:**

Sr No	Name of sample	Test (for evidence of)	Preservative / Packing	Collected YES/NO
1	Clothes (outer & inner)	For identification of any biological stains/ material from victim and scene of crime	Paper envelope	
2	Matted pubic hair	For detection of semen and identification of any hairs from victim	Paper envelope	
3	Combed pubic hairs	To identify foreign hairs by comparing with victim	Paper envelope	
4	Scalp hairs (10 to 15)	For comparison those found on victim and scene of crime	Paper envelope	
5	One swab & smear from prepuce, coronal sulcus	For detection of vaginal/buccal epithelial cells and DNA	Sterile tube & Paper envelope	
6	One swab & smear from glans and urethral meatus	For detection of vaginal/buccal epithelial cells and DNA	Sterile tube & Paper envelope	
7	Scrotal swab and smear	For detection of any biological stains	Sterile tube	
8	Swab and smear from stains on body	For detection of any biological stains	Sterile tube & Paper envelope	
9	Penile washing	For detection of vaginal/buccal epithelial cells and DNA	Sterile tube	
10	Buccal swab and smear	For detection of any biological stains and DNA	Paper envelope	
11	Nail clipping / scrapping	For detection of skin, blood, hair fiber of victim if human tissue blood group and DNA	Paper envelope	
12	Blood	Blood grouping	Plain bulb	
13	Blood	DNA analysis	EDTA bulb	
14	Blood	Drugs /alcohol	Fluoride and oxalate bulb	
15	Urine	Drugs /alcohol	Fluoride bulb	
16	Other object if any swab and smear	For detection of vaginal/buccal epithelial cells and DNA	Sterile tube & Paper envelope	

Note: Samples must be collected as per time elapsed between assault and examination, history received from alleged accused and clinical examination.

12. Provisional opinion:

I have examined _____ Sex _____

Aged _____ reporting on dated _____, _____ days/hours after the incidence.

My findings are as follows:

- Samples collected (for FSL): _____
- Samples collected (for hospital laboratory): _____
- Significant clinical findings: _____
- Additional observations (*if any*): _____

"The Opinion is kept pending awaiting the above laboratory reports**".**

(This report contains _____ number of sheets and _____number of envelopes.)

Place: _____ Signature of examining doctor_____

Name of examining doctor_____

Seal

13. Final Opinion *(After receiving Lab reports)*

Taking into consideration the history of the case, the data on clinical examination and the report of FSL (all being considered together) and other investigations

A. 1. Penetrative sexual assault i.e., of vaginal/ anal/ urethral/ oral penetration by the male sex organ. (*when presence of genital & physical injuries & the subject's penile washings show vaginal / buccal epithelium or faecal matter*)

2. Sexual assault by objects other than genitals (*when presence of physical injuries & the object shows presence of vaginal /buccal epithelium or faecal matter*)

3. No sexual and penetrative assault.

B. Intoxications (*Lab report positive for drugs/alcohol)*

C. Injuries suggestive of sexual assault (*when presence of genital & physical injuries over body & the subject's penile washings are negative for vaginal/buccal epithelium or faecal matter)*

D. Any other comments: _____

_____

Place: _____ Signature of examining doctor/s_____

Date & Time: _____ Name of examining doctor/s _____

Seal

12. Potency Certificate

Name of the Hospital: _____ MRD No: _____

Name of Person: _____

Age: _____ yrs, Sex: _____, Marital Status: _____

Address: _____

Brought By: _____

MLC No: _____ (*If Applicable*)

Consent: _____

_____

_____

(*This consent is explained to patient in* _____*language*)

Signature/Thumb impression

Identification Mark:

1. _____

2. _____

3. Left Thumb Impression

History:

1. Present History: _____

   _____

2. Past History: _____

   _____

3. Sexual History: _____

   _____

   _____

Examination:

1. **General Examination**:
   - i) Height: _____
   - ii) Weight: _____
   - iii) Physical Development: _____
   - iv) Secondary Sexual Characters: _____
   - v) Any Disease / Deformity: _____
   - vi) Examination of spine: _____

Systemic Examination

i) C.V.S.: _____

ii) R.S.: _____

iii) G.I.T.: _____

iv) C.N.S. _____

2. Local Examination:

i) Penis: _____

Development: _____

Sensation over glans: _____

Disease / Deformity: _____

Injury: _____

Any other: _____

ii) Scrotum: _____

Testis: _____

Descended / Undescended: _____

Disease / Deformity: _____

iii) Epididymis / Spermatic Cord: _____

3. Psychological Examination

_____

_____

_____

4. Laboratory Test:

1.

2.

3.

4.

5.

Opinion: _____

_____

_____

_____

Date: -
Place: -

Seal

Signature
Name of Doctor _____
Designation _____

13. Examination of Alcoholic Person (Drunkenness)

AIM:

a) To decide whether the subject is under the influence of alcohol, and if so to what extent.
b) To decide whether his condition is due to illness or injury;
c) To decide whether it is safe for him to be detained in a police station or to decide whether he is to be admitted to a hospital.
   A doctor should attend the case as soon as possible without any delay.

DEFINATION:

Drunkenness: 'It is a condition produced in a person who has taken alcohol in a quantity sufficient to cause him to lose control of his faculties to such an extent, that he is unable to execute safely, the occupation in which he is engaged at the particular time.'

Use of alcohol in human population –

Laboratory investigations –

Clinical Interpretation

a). The individual examined has not consumed alcohol.
No smell of alcohol in breath and / or lab analysis is negative, clinical examination normal.

b) The individual examined has consumed alcohol but not under influence of it.
Smell of alcohol in breath present and / or lab. Analysis reveals the presence of alcohol, but clinical examination reveals normal findings.

c) The individual examined has consumed alcohol and is under influence of it.
Smell of alcohol in breath present and / or lab. Analysis reveals the presence of alcohol, and clinical examination reveals *abnormal* findings (definite signs of muscular in co-ordination, dilated pupils with sluggish reaction to light, fine lateral nystagmus, slurred in-coherent speech, staggering gait, delayed reaction time, etc).

Under the influence (100 -200mg%) – flushed face, dilated sluggish pupil, euphoria, loss of restrain, increased reaction time, test errors, stagger on sudden turning.

Drunk (200-300mg%) - flushed face, dilated sluggish inactive pupils, clouding of intellect, incoordination of thoughts, speech and action, staggering gate with reeling and lurching while making sudden turn.

Very drunk – flushed or pale face, pupils inactive contracted or dilated, mental confusion, marked incoordination of thoughts, speech and action, staggering and reeling gate with tendency to lurch and fall, vomiting, amnesia.

Differential Diagnosis of Alcohol Intoxication

Head injury. Cerebral tumour, Incipient C.V.A., Epilepsy, Disseminated sclerosis. Acute aural vertigo. Hypoglycaemia, Hyperglycaemia, Thyrotoxicosis, Delirium. Uraemia, Hepatic failure. Fatigue, Carbon monoxide poisoning, Hypomania, Psychosis, Hysteria and, Drugs esp. *Insulin, Barbiturates, Antihistamines, Narcotics, Sedatives, Antidepressants.*

Medico-Legal Aspects of Drunkenness

Drunkenness and criminal responsibility –

- **Sec 85 IPC** – act of a person incapable of judgment of reason of intoxication caused against his will.
- **Sec 86 IPC** – offence requiring a particular intent or knowledge, committed by one who is intoxicated.

Drunkenness and consent –

- **Sec 90 IPC** – the consent given by an insane or intoxicated person who is unable to understand the nature and consequences of that to which he gives his consent is invalid.

Drunkenness and driving –

- **Sec 185 of Motor Vehicle Act** (1988, Amend. 1994) – 30 mg%
- **Sec 279 IPC** – Rash driving on a public way
- **Sec 287 IPC** – Negligent conduct with respect to machines.

Drunkenness and disturbance of the peace –

- **Sec 510** – Misconduct in by drunken person

Medico-legal examination

- **Sec 53 & 54 Cr.P.C**
  Bombay High court ruling – collection of samples does not violate constitutional right to privacy

Examination of Alcoholic Person (Drunkenness)

Date:

To,

The Investigating officer,

_____Police station_____

Subject: Regarding examination of person with alleged history of intoxication.

Reference: Your letter No _____Dated _____Police Station_____

Date and Exact time of examination:

Name of Person examined_____, Age_____ (in years)

Address: _____Occupation: _____

Consent: (Informed consent) _____

_____

_____

(*This consent is explained to patient in* _____*language*)

Signature / Thumb impression
(Subject/Guardian)

Examined in presence of-
Signature/Thumb impression-

Identification marks: (At least two unique identification marks)

i) _____

ii) _____

iii) Left Thumb Impression

History:

As stated by person examined_____

a. Has he consumed alcohol? If so, note the time, nature & quantity of the drink? _____

b. What food and drink he took last and when? _____

c. H/o fits, illness or other disability? _____

d. Is he Chronic alcoholic? Frequency of alcohol intake? _____

e. History of any medication? Nature & dose? _____

f . H/o Diabetes? Time of insulin taken & dose taken? _____

General appearance and demeanor:

a. State of clothing- Decent, disarrayed, soiled

b. Disposition- Calm, talkative, abusive, obscene

c. Speech- Incoherent/ slurred/clear

d. Gait- Steady/ staggering, self-control

General examination-

1) B.P.: _____ _____

2) Pulse (rapid & bounding, slow, etc.): _____

3) Temperature (surface temp. raised, lowered, normal): _____

4) Skin (dry, moist, flushed or pale): _____

5) Mouth (smell of alcohol, dribbling of saliva, _____
furred tongue, dry lips, etc.): _____

6) Eyes (lids swollen or red, conjunctivae congested or _____
not, visual acuity, pupils dilated or contracted, _____
nystagmus (+/-) & reaction of pupil to light & accommodation): _____

7) Gait:

(a) Manner of walking (unsteady/ steady). _____

(b) Reaction time to a direction to turn. _____

(c) Manner of turning (normal/ staggering). _____

8. Muscular coordination: _____

(Perform any of the test enumerated below

a. Walking along a straight line, b. Finger nose test _____

c. Picking up a coin from the floor, d. Romberg's sign/test _____

e. Handwriting, f. Copying simple geometric figures) _____

Examination of System (to exclude any other condition)

a. Central Nervous system _____

b. Cardiovascular system _____

c. Respiratory System_____

d. Abdomen _____

Examination of bodily Injuries (If any): _____

_____

_____

Laboratory investigation:

Blood / Urine for chemical examination: _____

_____

_____

Any other: _____

_____

Diagnosis: _____

_____

Opinion: I am of opinion that the above person has:

(1) Consumed alcohol and is under its influence.

(2) Consumed alcohol, but is not under its influence.

(3) Not consumed alcohol.

Place: Signature of Doctor:

Date: Name:

Designation:

Chapter—XIII—Blood Test

{136} THE BOMBAY PROHIBITION (MEDICAL EXAMINATION AND BLOOD TEST) RULES, 1959

"Registered Medical Practitioner" means any registered medical practitioner authorised by general or special order by the State Government under sub-section (4) of section 129-A of the Act;

"Testing Officer" means the Chemical Examiner or assistant Chemical examiner to government or any other officer appointed by the State Government for testing blood under sub-section (1) of section 129-A of the Act.

Medical examination.—A registered medical practitioner before whom a person is produced under sub-section (1) of section 129-A of the Act by a Police Officer or a Prohibition Officer for the purpose of medical examination of such person or collection of his blood, shall examine such person and if he deems necessary, collect and forward in the manner prescribed in these Rules, the blood of such person and furnish to the officer by whom such person was produced a certificate in Form 'A' containing the result of his examination and shall keep a copy of such certificate on his record.

Manner of collection and forwarding of blood—

(1) The registered medical practitioner shall use a syringe for the collection of the blood of the person produced before him under rule 3 the syringe shall be sterilised by purring in boiling water before it is used for the aforesaid purpose. He shall clean with sterilized water and swab the skin surface of the part of such person's body from which he intends to withdraw the blood. No alcohol shall be touched at any stage while withdrawing blood from the body of the person. He shall withdraw not less than 5 c. c. of venous blood in the syringe from the body of the person. The blood collected in the syringe shall then be transferred into a phial containing anti-coagulant and preservative and the phial shall then be shaken vigorously to dissolve the anti-coagulant and preservative in the blood. The phial shall be labelled and its cap sealed by means of sealing wax with the official seal or the monogram of the registered medical practitioner.

(2) The sample blood collected in the phial in the manner stated in sub-rule (1) shall be forward for test to the Testing Officer either by post or with a special messenger so as to reach him within seven days from the date of its collection. It shall be accompanied by a forwarding letter in form 'B' which shall bear a facsimile of the seal or monogram used for sealing the phial of the sample blood.

Certificate of test of sample blood. —The Testing Officer shall on receipt of the sample blood, test it and shall certify the result of his test in Form 'C.' The Testing Officer shall send the certificate in duplicate to the registered medical practitioner by whom the blood was forwarded to him for test and retain a copy thereof on his record. On receipt of the certificate from the Testing Officer, the registered medical practitioner shall forward the original copy of the certificate to the Police Officer or the Prohibition Officer concerned. The duplicate copy of the certificate shall be kept by him on his record.

FORM 'A'

(*See* rule 3)

Certificate by a registered medical practitioner showing whether a person examined by him has or has not consumed an intoxicant.

Serial No._____ (Name and location of the Dispensary or Hospital)

Certified that Shri/Smt./Kumari. _____

of _____ was brought to this hospital/dispensary by _____

_____ (*here state name and designation of the Officer*) on _____20___, at_____ A.M./P.M.

and was examined by me on _____20___, at_____ A.M./P.M

A clinical examination of the above-named person disclosed the following:

Age _____

Weight _____

Breath : Smelling / Not smelling
(Alcohol / ganja /bhang/ charas / opium)

Speech : Incoherent / Normal

Gait : Unsteady / Steady

Pupils : Dilated / Normal

Additional remarks, *if any*. : _____

I find that the above-named person has consumed alcohol/opium/ charas/ ganja/ bhang. / has not consumed any intoxicant.

I also find that he is / is not under the influence of alcohol.

N. B.—

(Blood from the body of the above named was / was not collected by me for chemical examination).

Dated: _____20___ (Signature) _____

Place: _____ Designation _____

Signature/Thumb-impression
of the person examined.

Marks of identification of the person examined in case he refuses to give his signature or thumb-impression.

FORM 'B'

[*See* rule 4 (2)]

No. _____

From

_____

(Name, designation and address of the registered medical practitioner.)

To,

_____

(Name, designation and address of the Testing Officer.)

Dated _____ 20

Sir,

I, forward herewith by post/with Shri* _____

of _____ a phial bearing serial No. _____

containing_____ c. c. of venous blood collected by me on_____

at. _____ A.M./P.M. of _____

who was produced before me for medical examination †and / or collection of blood from his / her body

‡ by _____

and request you to test the blood and issue a certificate (in duplicate) regarding the result of the test.

Yours faithfully,
Signature and designation of the
registered medical practitioner.

Facsimile of the seal or monogram used for
sealing the phial containing the blood.

---

* Here specify the name, designation and address of the messenger with whom the phial containing the blood is forwarded for delivery to the Testing Officer.

† Strike off, if these words are not required.

‡ Here state the name and designation of the officer by whom the said person was produced for collection of blood.

FORM 'C'

(*See* rule 5)

Alcohol Examination Certificate

No. R _____of _____

I. Case No. _____

Dated _____

From,

_____

(Here mention name, designation and address of testing officer.)

To,

(_____ ,

(Here mention the name, designation and address of Registered Medical Practitioner.)

Your letter No. _____Dated _____, forwarding a phial containing blood of Shri/Smt./Kumari. _____ of _____ bearing Serial No._____ labelled. _____ received here on _____ by post/with messenger Shri _____of _____ sealed/unsealed, seal perfect and as per copy sent/seals intact device no copy sent.

Result of the test of the blood

The blood contained _____ per cent. W/V of ethyl-alcohol.

Method, Factual Data and Reasons leading to the Result of Blood analysis

(1) *Method of Analysis*—Modified Cavette's Method Journal Analytical Chemistry, 1959, 31, 1908. It is based on oxidation of alcohol by chromic acid as that in Cavette's Method but the oxidation is carried out in vacuum and at room temperature. It takes only a fraction of a minute instead of a few hours to complete the reaction. Ketonic bodies are volatile acids do not interfere in this method. All usual precautions essential in microanalytical work mentioned in the paper referred to above have been strictly followed, *e.g.*, all chemical used in the test were of reagent quality the apparatus was first cleaned with hot chromic acid, then repeatedly with tap water and finally with distilled water. 2[It was then dried in hot air oven.] No grease was used anywhere in the apparatus. The atmosphere of the room where the test was caried out was free from all gases or suspended impurities. Fresh glass-distilled water used throughout the test.

(2) *Factual Data and Reasons for arriving at the findings pertaining to the blood sample in question*.-

Analysed on _____

Smell: Nothing to note/Has characteristic smell of _____

Quantity of blood taken for analysis : 0.5 ml.

Quantity of N/20 dichromate taken : 5.00 ml.

Quantity of N/20 dichromate used up in oxidising alcohol in the sample _____ ml.

1 ml. of N/20 dichromate oxidises 0.000575 gramme of ethyl-alcohol.

2[Therefore, 100 ml. of blood contained. 0.000575 x _____ ml. of dichromate used x 100 _____gramme of 0.50 ethyl-alcohol.]

Signature and Designation of testing officer

_____

Note.—(1) WV = _____ grammes of ethyl-alcohol in 100 c. c. of blood.

(2) The blood sample was stored in refrigerator from the time it was received in the laboratory till it was taken for analysis.

1. Subs. by G. N. of 26-9-1963.
2. Subs. by G. N. of 6-12-1963.

Format of Medico-Legal report of a person in Police, Judicial Custody or Referred by court of Law and Violation of Human rights as requirement of NMRC, who has been brought for Medical Examination.

14. Medico-Legal Examination of person at the time of entry into in Police / Judicial Custody and periodically thereafter

To, Date:

The Investigating Officer,

_____Police station, _____

Sub: - Submission of Medico-legal report of person in Police / Judicial Custody

Ref: - 1. Your Order / letter No._____ Dated_____

2. Case No._____

Sir,

I /We hereby certify that, I/We have examined Mr./Mrs. _____

S/O or D/O _____ Age (as Stated)_____ Sex_____

Residing at _____ as a person in police / Judicial custody

brought by PC/PN/HC_____ of _____ Police station.

Consent for Medical Examination:

_____

_____

(*This consent is explained to patient in _____language*)

Signature/Thumb impression
(Subject/Guardian)

Examined in presence of-
Signature/Thumb impression-

Date and time of admission in prison: _____

Identification Marks:

1. _____

2. _____

3 Left Thumb Impression

Previous history of illness: _____ **History of drug abuse,** if any? _____

Any information the prisoner may volunteer: _____

Physical Examination:

Hight_____ Weight_____ Pulse _____/sec BP_____/_____of Hg

RR_____/ min Temperature _____ LMP:_____

Pallor: _____ Clubbing: _____ Cyanosis: _____ Icterus: _____

CNS_____CVS_____

RS_____GIT_____

Eye/ENT_____ Urinary system_____

Investigations, if any clinically required:

Pathological tests: _____

X-ray Chest: _____

ECG: _____

Blood tests: _____

Bodily Injuries if any:

_____

_____

(Please see for all body areas & Prepare Separate Injury report of if any injury/injuries are present)

(If any history of previous mental illness/ finding of suicidal tendencies etc., psychiatrist's opinion to be sought)

(The medical examination and investigations were conducted with the consent of the prisoner after explaining to him/ her that it was necessary for diagnosis and treatment.)

The Medical examination done on Mr._____, By Me/Us bearing above mentioned identification marks does not show any disease, constitutional weakness or bodily infirmity except_____(NIL)

He / She is - Fit. / -Temporary Unfit. / - Unfit.

Time of commencement of medical examination:

Date of completion of medical examination:

Signature

Place: -

Name of Doctor _____

Seal: -

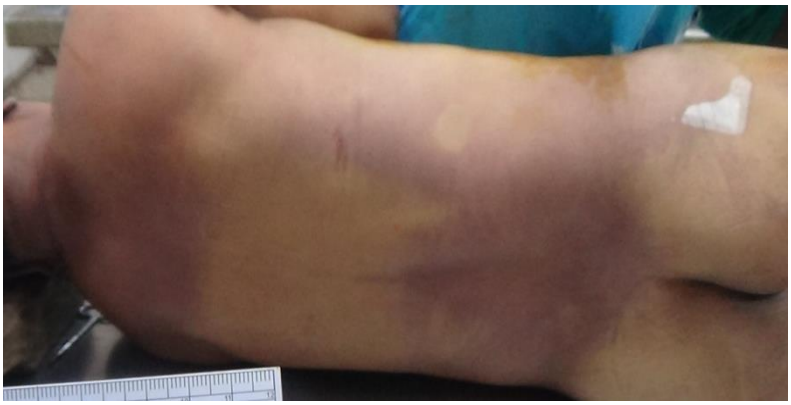
Designation _____

Part- II

Medico-legal Articles

Photographs

I. Post-mortem lividity



1. Identify the photograph- _____

_____

2. Observations- _____

_____

_____

3. Medicolegal Importance (MLI)- _____

_____

_____

II. Decomposition changes-

1. Identify the photograph- _____

_____

2. Observations- _____

_____

_____

3. Medicolegal Importance (MLI)- _____

_____

_____

III. Decomposition changes-

1. Identify the photograph- _____

_____

2. Observations- _____

_____

_____

3. Medicolegal Importance (MLI)- _____

_____

_____

IV. Injury-

1. Identify the photograph- _____

_____

2. Observations- _____

_____

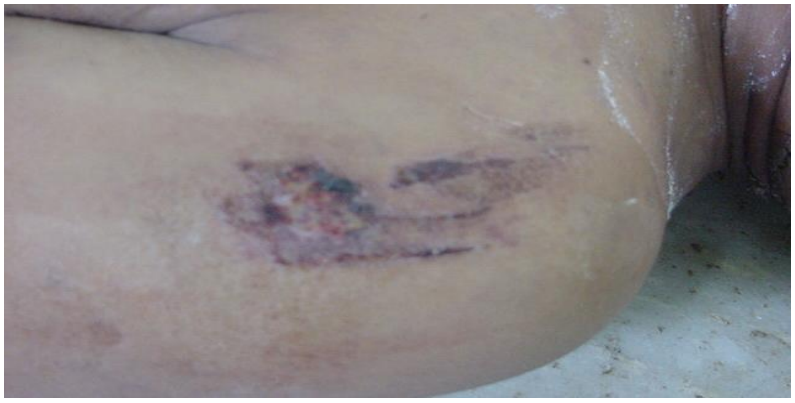
_____

3. Medicolegal Importance (MLI)- _____

_____

_____

V. Injury-



1. Identify the photograph- _____

   _____

2. Observations- _____

   _____

   _____

3. Medicolegal Importance (MLI)- _____

   _____

   _____

VI. Injury

1. Identify the photograph- _____

   _____

2. Observations- _____

   _____

   _____

3. Medicolegal Importance (MLI)- _____

   _____

   _____

VII. Injury-

1. Identify the photograph- _____

_____

2. Observations- _____

_____

_____

3. Medicolegal Importance (MLI)- _____

_____

_____

VIII. Injury

1. Identify the photograph- _____

_____

2. Observations- _____

_____

_____

3. Medicolegal Importance (MLI)- _____

_____

_____

IX. Injury-

1. Identify the photograph- _____

_____

2. Observations- _____

_____

_____

3. Medicolegal Importance (MLI)- _____

_____

_____

X. Injury-

1. Identify the photograph- _____

_____

2. Observations- _____

_____

_____

3. Medicolegal Importance (MLI)- _____

_____

_____

XI. Injury-

1. Identify the photograph- _____

_____

2. Observations- _____

_____

_____

3. Medicolegal Importance (MLI)- _____

_____

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XII. Injury and identification-

1. Identify the photograph- _____

_____

2. Observations- _____

_____

_____

3. Medicolegal Importance (MLI)- _____

_____

_____

XIII. Injury-

1. Identify the photograph- _____

_____

2. Observations- _____

_____

_____

3. Medicolegal Importance (MLI)- _____

_____

_____

XIV. Injury-

1. Identify the photograph- _____

_____

2. Observations- _____

_____

_____

3. Medicolegal Importance (MLI)- _____

_____

_____

XV. Asphyxia-

1. Identify the photograph- _____

_____

2. Observations- _____

_____

_____

3. Medicolegal Importance (MLI)- _____

_____

_____

XVI.

1. Identify the photograph- _____

_____

2. Observations- _____

_____

_____

3. Medicolegal Importance (MLI)- _____

_____

_____

Asphyxia-

1. Identify the photograph- _____

   _____

2. Observations- _____

   _____

   _____

3. Medicolegal Importance (MLI)- _____

   _____

   _____

XVII.

1. Identify the photograph- _____

   _____

2. Observations- _____

   _____

   _____

3. Medicolegal Importance (MLI)- _____

   _____

   _____

XVIII.

1. Identify the photograph- _____

   _____

2. Observations- _____

   _____

   _____

3. Medicolegal Importance (MLI)- _____

   _____

   _____

XIX.

1. Identify the photograph- _____

   _____

2. Observations- _____

   _____

   _____

3. Medicolegal Importance (MLI)- _____

   _____

   _____

XX.

1. Identify the photograph- _____

   _____

2. Observations- _____

   _____

   _____

3. Medicolegal Importance (MLI)- _____

   _____

   _____

XXI.

1. Identify the photograph- _____

   _____

2. Observations- _____

   _____

   _____

3. Medicolegal Importance (MLI)- _____

   _____

   _____

XXII.

1. Identify the photograph- _____

   _____

2. Observations- _____

   _____

   _____

3. Medicolegal Importance (MLI)- _____

   _____

   _____

XXIII.

1. Identify the photograph- _____

   _____

2. Observations- _____

   _____

   _____

3. Medicolegal Importance (MLI)- _____

   _____

   _____

Museum Specimens

Sr. No.	Observation	Identification / Opinion	Medicolegal Importance
1			
2			
3			
4			
5			

Sr. No.	Observation	Identification / Opinion	Medicolegal Importance
6			
7			
8			
9			
10			

Sr. No.	Observation	Identification / Opinion	Medicolegal Importance
11			
12			
13			
14			
15			

Sr. No.	Observation	Identification / Opinion	Medicolegal Importance
16			
17			
18			
19			
20			

Instruments

Sr. No.	Identification	Medico-legal Significance / Uses
1		
2		
3		
4		
5		

Sr. No.	Identification	Medico-legal Significance / Uses
6		
7		
8		
9		
10		

Sr. No.	Identification	Medico-legal Significance / Uses
11		
12		
13		
14		
15		

Sr. No.	Identification	Medico-legal Significance / Uses
16		
17		
18		
19		
20		

X-Rays

1.

Describe X-Ray: _____

_____

_____

Observation: _____

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_____

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_____

Opinion: _____

_____

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2.

Describe X-Ray: _____

_____

_____

Observation: _____

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_____

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_____

_____

Opinion: _____

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_____

3.

Describe X-Ray: _____

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_____

Observation: _____

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Opinion: _____

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4.

Describe X-Ray: _____

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_____

Observation: _____

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Opinion: _____

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5.

Describe X-Ray: _____

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_____

Observation: _____

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Opinion: _____

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6.

Describe X-Ray: _____

_____

_____

Observation: _____

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Opinion: _____

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7.

Describe X-Ray: _____

Observation: _____

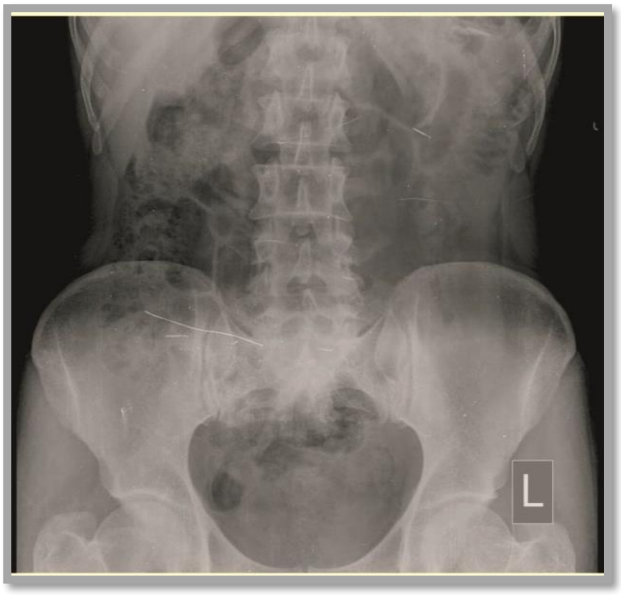
Opinion: _____

8.

Describe X-Ray: _____

Observation: _____

Opinion: _____



9.

Describe X-Ray: _____

Observation: _____

Opinion: _____

10 Describe X-Ray: _____

_____

_____

Observation: _____

_____

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_____

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_____

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_____

Opinion: _____

_____

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11

Describe X-Ray: _____

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_____

Observation: _____

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_____

_____

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_____

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Opinion: _____

_____

_____

12 Describe X-Ray: _____

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Observation: _____

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Opinion: _____

_____

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13

Describe X-Ray: _____

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Observation: _____

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Opinion: _____

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14 Describe X-Ray: _____

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_____

Observation: _____

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Opinion: _____

_____

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15

Describe X-Ray: _____

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Observation: _____

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Opinion: _____

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Paste

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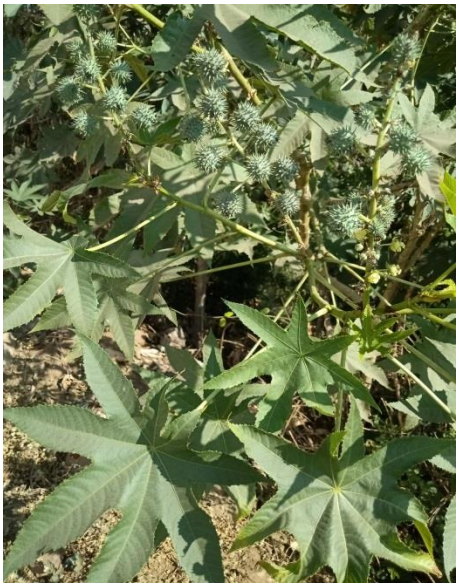
Poisons

Madar (Calotropis Gigantea)

Yellow Oleander Plant
(Cerbera Thevetia)

Pink Kaner (Nerium Odorum)

Millipede



Castor Plant (Ricinus Communis) with fruits

Castor Seeds (Ricinus Communis)

Ratti /Gunja seeds
(Abrus Precatorius)

Chilli seeds (Capsicum annum)

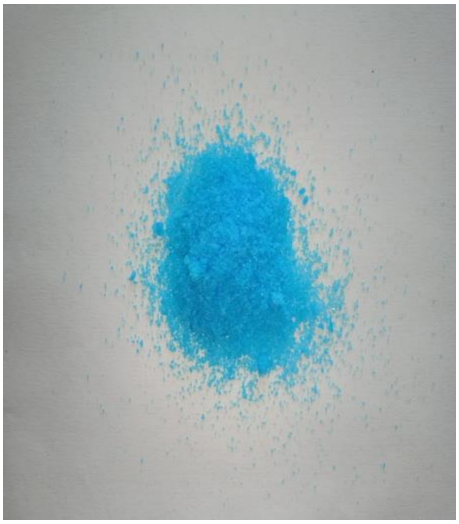
Marking Nuts/ Bhilawa
(Semecarpus anacardium)

Nux Vomica (Strychnine)

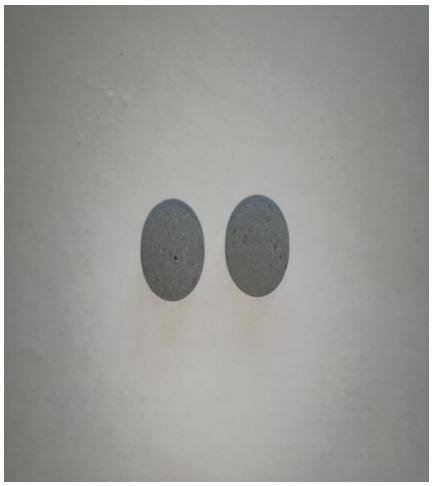
Tobacco (Nicotiana Tabacum)

Datura Seeds

Bitter Almonds



Copper Sulphate Crystals



Aluminium Phosphide
(Celphos)

Poppy Seeds (Khaskhas)

Lead tetroxide (Sindur)

Alcohol (Ethanol)

Study of Common Poisons of Medico-legal Importance

Sr. No.	Name of Poison	Type of Poison	Physical Characters	Salient Clinical Features	Fatal Dose
1	**Sulphuric Acid**				
2	**Nitric Acid**				
3	**Hydrochloric acid**				
4	**Carbolic Acid** (Phenol)				

Fatal Period	Treatment	Post-mortem Features	Medicolegal Significance

Sr. No.	Name of Poison	Type of Poison	Physical Characters	Salient Clinical Features	Fatal Dose
5	**Oxalic Acid**				
6	**Sodium Hydroxide**				
7	**Potassium Hydroxide**				
8	**Phosphorus**				

Fatal Period	Treatment	Post-mortem Features	Medicolegal Significance

Sr. No.	Name of Poison	Type of Poison	Physical Characters	Salient Clinical Features	Fatal Dose
9	**Lead Oxide**				
10	**Arsenic Oxide**				
11	**Mercuric Sulphide**				
12	**Copper Sulphate**				

Fatal Period	Treatment	Post-mortem Features	Medicolegal Significance

Sr. No.	Name of Poison	Type of Poison	Physical Characters	Salient Clinical Features	Fatal Dose
13	**Glass Powder**				
14	**Castor Seeds** (Ricinus Communis				
15	**Croton Seeds** (Croton Tiglium)				
16	**Red chillies** (Capsicum annum)				

Fatal Period	Treatment	Post-mortem Features	Medicolegal Significance

Sr. No.	Name of Poison	Type of Poison	Physical Characters	Salient Clinical Features	Fatal Dose
17	**Marking Nut/ Bhilwa** (Semicarpus Anacardium)				
18	**Madar** (Calotropis Gigantea)				
19	**Ratti /Gunja** (Abrus Precotorius)				
20	**Dhatura** (Thorn apple)				

Fatal Period	Treatment	Post-mortem Features	Medicolegal Significance

Sr. No.	Name of Poison	Type of Poison	Physical Characters	Salient Clinical Features	Fatal Dose
21	**Bhang/ Ganja** (Canabis Indica)				
22	**Opium/ Afeem** (Papaver Somniferum)				
23	**Bitter Almond** (Hydrocynic acid)				
24	**Aconite** (Mitha Jahar)				

Fatal Period	Treatment	Post-mortem Features	Medicolegal Significance

Sr. No.	Name of Poison	Type of Poison	Physical Characters	Salient Clinical Features	Fatal Dose
25	**Yellow Oleander** (Cerebra Thevecia)				
26	**Nux Vomica** (Strychnine)				
27	**Snakes:** Cobra				
28	**Snakes**: Krait				

Fatal Period	Treatment	Post-mortem Features	Medicolegal Significance

Sr. No.	Name of Poison	Type of Poison	Physical Characters	Salient Clinical Features	Fatal Dose
29	**Snakes**: Viper				
30	**Scorpion**				
31	**Honey bees** (sting Bite)				
32	**Methyl Alcohol**				

Fatal Period	Treatment	Post-mortem Features	Medicolegal Significance

Sr. No.	Name of Poison	Type of Poison	Physical Characters	Salient Clinical Features	Fatal Dose
33	**Kerosene**				
34	**Barbaturates**				
35	Organopho-sphorus compound (**Follidon & Tik-20**)				
36	Organo-chloro compound (**D.D.T**.)				

Fatal Period	Treatment	Post-mortem Features	Medicolegal Significance

Sr. No.	Name of Poison	Type of Poison	Physical Characters	Salient Clinical Features	Fatal Dose
37	Organo-chloro compound (**Endrine**)				
38	**Carbamates** (Carbaryl)				
39	**Tobacco** (Nicotiana Tobacum)				
40	**Tincture Iodine**				

Fatal Period	Treatment	Post-mortem Features	Medicolegal Significance

Sr. No.	Name of Poison	Type of Poison	Physical Characters	Salient Clinical Features	Fatal Dose
41	**Celphos/ Alphos** (Aluminium Phosphide)				
42	**Amphetamines** /Ecstacy / Designer drug				
43	**Cocaine** (Erythroxylum coca)				
44	**Mushrooms** (Amanita Phalloides & Amanita Muscaria)				

Fatal Period	Treatment	Post-mortem Features	Medicolegal Significance

Sr. No.	Name of Poison	Type of Poison	Physical Characters	Salient Clinical Features	Fatal Dose
45	**Paracetamol** (Acetamino-phen)				
46	**Fish Poisoning**				
47	**Mother-in - law's tongue** (D**umbcane**) Dieffenbachia Snake plant (common)				
48					

Fatal Period	Treatment	Post-mortem Features	Medicolegal Significance

Sr. No.	Name of Poison	Type of Poison	Physical Characters	Salient Clinical Features	Fatal Dose
49					
50					
51					
52					

Fatal Period	Treatment	Post-mortem Features	Medicolegal Significance

Part- III
Medico-legal Autopsy

Medico-legal Autopsies observed by students

Sr. No.	P.M. No./ Year Date	Cause of Death	Signature
1	/		
2	/		
3	/		
4	/		
5	/		
6	/		
7	/		
8	/		
9	/		
10	/		
11	/		
12	/		
13	/		
14	/		
15	/		

Indoor/Casualty no: **PM No:**

Hospital: ADR No.:

Police station:

Memorandum of a Post-mortem Examination held at _____ Hospital on the body of **Name** **, Age- Yrs, Sex , Religion** of village/City: Taluka: District**:** by **Dr** /_____ Hospital _____.

I. General Particulars: -

1. (a) By whom was the corpse sent?

   (b) Name of place from which sent.

   (c) Distance of place from which sent.

2. By whom was the corpse brought?

3. By whom identified? i.

   ii

4. (a) The date, hour and minute of its receipt.

   (b)The date, hour and minute of beginning of post mortem Examination

   (c)The date, hour and minute of ending of postmortem examination.

5. Substance of accompanying report from police office or magistrate, together with the date of death, if known. Supposed cause of death or reason, for examination.

6. If not examined at dispensary or hospital-
   (a) Name of place where examined -
   (b) Distance from Dispensary or hospital.
   (c) Reason why the body was not sent to the dispensary or hospital.

II. External Examination: -

7. Sex, apparent age, race or caste, Description of clothes and of ornaments on the body.

8. Condition of the clothes – Whether wet with water, stained with blood or soiled with vomit or faecal matter.

9. Special marks on the skin such as scars, tattooing etc, any malformations peculiarities or other marks of identification. State of the teeth.

   In newly-born infants: -
   The length and (if possible), the weight of the body is to be recorded together with the state of the hair, nails and umbilical cord, its length, whether placenta is attached or not, and if present, its size and condition.

10. Condition of Body- Whether well nourished, thin or emaciated warm or cold.

11. Rigor Mortis- Well-marked, slight or absent whether present

12. Extent and signs of decomposition, presence or post-mortem lividity of buttocks, loins, back and things or any other part. Whether bullae present and the nature of the it contains fluid, condition of the cuticle.
13. Feature- Whether natural or swollen, state of eyes, position of tongue; nature of fluid (if any) oozing from mouth, nostrils or ears.
14. Conditions of skin etc.
In suspected drowning the presence or absence of cutes anserine is to be noted.
15. Injuries to external genitals.
Indication of purging.

16. Position of limbs- Especially of arms and of Fingers or on the skin of hands and feet.

17. Surface wounds, and injuries- Their nature, position, dimensions(measured) and directions to be accurately stated- their probable age and causes to be noted.
If bruises be present, what is the condition of the subcutaneous tissues?
(N.B- When injuries are numerous and cannot be mentioned within the space available they should be mentioned on a separate paper which should be signed.)

18. Other injuries discovered by external examination or palpation of fractures etc.
18a. Can you say definitely that the injuries shown against serial nos. 17 and 18 are ***ante-mortem injuries?***

III. Internal Examination: -

19. Head: -

(i) Injuries under the scalp and their nature.

(ii) Skull: vault and base-describe fractures their sites, dimensions, direction etc.

(iii) Brain: The appearance of its Coverings, size, weight and general condition of the organ itself and any abnormality found in its examination to be carefully noted.

20. Thorax: -

(a) Walls, ribs, cartilages

(b) Pleura

(c) Larynx, Trachea and bronchi

(d) Right Lung with weight

(e) Left Lung with weight

(f) Pericardium

(g) Heart with weight

(h) Large vessels

(i) Additional remarks

21. Abdomen: -

(a) Walls -

(b) Peritoneum -

(c) Cavity-

(d) Buccal cavity, teeth, tongue and pharynx-

(e) Oesophagus-

(f) Stomach and its contents-

(g) Small intestine and its contents-

(h) Large intestine and its contents-

(i) Liver and gall bladder with weight-

(j) Pancreas and suprarenals-

(k) Spleen with weight.

(l) Kidneys with weights

(m) Bladder-

(o) Organ of generation-

(p) Additional remarks with, wherever possible, Medical Officer's deduction from the state of contents of the stomach as to the time of death and last meal.

(q) State which viscera, (if any) have been retained for chemical examination and also quote the numbers on the bottles containing the same-

22. Spine and spinal cord-

23. a) Whether the ante-mortem injuries found on the dead body were sufficient in the ordinary course of nature to cause death?

(b) If yes, which of the injuries were individually sufficient in the ordinary course of nature to cause death?

(c) Which of the injuries collectively are sufficient in the ordinary course of nature to cause death?

Opinion as to the probable/Final cause of death: -

Sign
Name of Doctor and seal

PM no:
Dated:

*The spinal cord need not be examined unless there are any indications of disease, strychnine poisoning or injury.
Note: - The report must be written and signed immediately after the examination. Medical officers will at once dispatch a duplicate copy to the Civil Surgeon of their district for in his office.
Great care should be taken not to cut viscera before they have been inspected in *Situ.*

Post Mortem No. :- , Dated:

1. Place:

Forwarded to the **,** P.S. for information with reference to his No. / of Dated: .

2. Viscera has been/ **not** been preserved.

Sign
Name of Doctor and seal

PM no:
Dated:

Indoor/Casualty no: **PM No:**

Hospital: ADR No.:

Police station:

Memorandum of a Post-mortem Examination held at _____ Hospital on the body of **Name** **, Age- Yrs, Sex , Religion**

of village/City: Taluka: District**:**

by **Dr** /_____ Hospital _____.

I. General Particulars: -

1. (a) By whom was the corpse sent?

   (b) Name of place from which sent.

   (c) Distance of place from which sent.

2. By whom was the corpse brought?

3. By whom identified? i.

   ii

4. (a) The date, hour and minute of its receipt.

   (b)The date, hour and minute of beginning of post mortem Examination

   (c)The date, hour and minute of ending of postmortem examination.

5. Substance of accompanying report from police office or magistrate, together with the date of death, if known. Supposed cause of death or reason, for examination.

6. If not examined at dispensary or hospital-

   (a) Name of place where examined -

   (b) Distance from Dispensary or hospital.

   (c) Reason why the body was not sent to the dispensary or hospital.

II. External Examination: -

7. Sex, apparent age, race or caste, Description of clothes and of ornaments on the body.

8. Condition of the clothes – Whether wet with water, stained with blood or soiled with vomit or faecal matter.

9. Special marks on the skin such as scars, tattooing etc, any malformations peculiarities or other marks of identification. State of the teeth.

   In newly-born infants: -

   The length and (if possible), the weight of the body is to be recorded together with the state of the hair, nails and umbilical cord, its length, whether placenta is attached or not, and if present, its size and condition.

10. Condition of Body- Whether well nourished, thin or emaciated warm or cold.

11. Rigor Mortis- Well-marked, slight or absent whether present

12. Extent and signs of decomposition, presence or post-mortem lividity of buttocks, loins, back and things or any other part. Whether bullae present and the nature of the it contains fluid, condition of the cuticle.
13. Feature- Whether natural or swollen, state of eyes, position of tongue; nature of fluid (if any) oozing from mouth, nostrils or ears.
14. Conditions of skin etc.
In suspected drowning the presence or absence of cutes anserine is to be noted.
15. Injuries to external genitals.
Indication of purging.

16. Position of limbs- Especially of arms and of Fingers or on the skin of hands and feet.

17. Surface wounds, and injuries- Their nature, position, dimensions(measured) and directions to be accurately stated- their probable age and causes to be noted.
If bruises be present, what is the condition of the subcutaneous tissues?
(N.B- When injuries are numerous and cannot be mentioned within the space available they should be mentioned on a separate paper which should be signed.)

18. Other injuries discovered by external examination or palpation of fractures etc.
18a. Can you say definitely that the injuries shown against serial nos. 17 and 18 are ***ante-mortem injuries?***

III. Internal Examination: -

19. Head: -

(i) Injuries under the scalp and their nature.

(ii) Skull: vault and base-describe fractures their sites, dimensions, direction etc.

(iii) Brain: The appearance of its Coverings, size, weight and general condition of the organ itself and any abnormality found in its examination to be carefully noted.

20. Thorax: -

(a) Walls, ribs, cartilages

(b) Pleura

(c) Larynx, Trachea and bronchi

(d) Right Lung with weight

(e) Left Lung with weight

(f) Pericardium

(g) Heart with weight

(h) Large vessels

(i) Additional remarks

21. Abdomen: -

(a) Walls -

(b) Peritoneum -

(c) Cavity-

(d) Buccal cavity, teeth, tongue and pharynx-

(e) Oesophagus-

(f) Stomach and its contents-

(g) Small intestine and its contents-

(h) Large intestine and its contents-

(i) Liver and gall bladder with weight-

(j) Pancreas and suprarenals-

(k) Spleen with weight.

(l) Kidneys with weights

(m) Bladder-

(o) Organ of generation-

(p) Additional remarks with, wherever possible, Medical Officer's deduction from the state of contents of the stomach as to the time of death and last meal.

(q) State which viscera, (if any) have been retained for chemical examination and also quote the numbers on the bottles containing the same-

22. Spine and spinal cord-

23. a) Whether the ante-mortem injuries found on the dead body were sufficient in the ordinary course of nature to cause death?

(b) If yes, which of the injuries were individually sufficient in the ordinary course of nature to cause death?

(c) Which of the injuries collectively are sufficient in the ordinary course of nature to cause death?

Opinion as to the probable/Final cause of death: -

Sign
Name of Doctor and seal

PM no:
Dated:

*The spinal cord need not be examined unless there are any indications of disease, strychnine poisoning or injury.
Note: - The report must be written and signed immediately after the examination. Medical officers will at once dispatch a duplicate copy to the Civil Surgeon of their district for in his office.
Great care should be taken not to cut viscera before they have been inspected in *Situ.*

Post Mortem No. :- , Dated:

1. Place:

Forwarded to the **,** P.S. for information with reference to his No. / of Dated: .

2. Viscera has been/ **not** been preserved.

Sign
Name of Doctor and seal

PM no:
Dated:

Indoor/Casualty no: **PM No:**

Hospital: ADR No.:

Police station:

Memorandum of a Post-mortem Examination held at _____ Hospital on the body of **Name** **, Age- Yrs, Sex , Religion**

of village/City: Taluka: District**:**

by **Dr** /_____ Hospital _____.

I. General Particulars: -

1. (a) By whom was the corpse sent?

   (b) Name of place from which sent.

   (c) Distance of place from which sent.

2. By whom was the corpse brought?

3. By whom identified? i.

   ii

4. (a) The date, hour and minute of its receipt.

   (b)The date, hour and minute of beginning of post mortem Examination

   (c)The date, hour and minute of ending of postmortem examination.

5. Substance of accompanying report from police office or magistrate, together with the date of death, if known. Supposed cause of death or reason, for examination.

6. If not examined at dispensary or hospital-

   (a) Name of place where examined -

   (b) Distance from Dispensary or hospital.

   (c) Reason why the body was not sent to the dispensary or hospital.

II. External Examination: -

7. Sex, apparent age, race or caste, Description of clothes and of ornaments on the body.

8. Condition of the clothes – Whether wet with water, stained with blood or soiled with vomit or faecal matter.

9. Special marks on the skin such as scars, tattooing etc, any malformations peculiarities or other marks of identification. State of the teeth.

In newly-born infants: -

The length and (if possible), the weight of the body is to be recorded together with the state of the hair, nails and umbilical cord, its length, whether placenta is attached or not, and if present, its size and condition.

10. Condition of Body- Whether well nourished, thin or emaciated warm or cold.

11. Rigor Mortis- Well-marked, slight or absent whether present

12. Extent and signs of decomposition, presence or post-mortem lividity of buttocks, loins, back and things or any other part. Whether bullae present and the nature of the it contains fluid, condition of the cuticle.
13. Feature- Whether natural or swollen, state of eyes, position of tongue; nature of fluid (if any) oozing from mouth, nostrils or ears.
14. Conditions of skin etc.
In suspected drowning the presence or absence of cutes anserine is to be noted.
15. Injuries to external genitals.
Indication of purging.

16. Position of limbs- Especially of arms and of Fingers or on the skin of hands and feet.

17. Surface wounds, and injuries- Their nature, position, dimensions(measured) and directions to be accurately stated- their probable age and causes to be noted.
If bruises be present, what is the condition of the subcutaneous tissues?
(N.B- When injuries are numerous and cannot be mentioned within the space available they should be mentioned on a separate paper which should be signed.)

18. Other injuries discovered by external examination or palpation of fractures etc.
18a. Can you say definitely that the injuries shown against serial nos. 17 and 18 are ***ante-mortem injuries?***

III. Internal Examination: -

19. Head: -

(i) Injuries under the scalp and their nature.

(ii) Skull: vault and base-describe fractures their sites, dimensions, direction etc.

(iii) Brain: The appearance of its Coverings, size, weight and general condition of the organ itself and any abnormality found in its examination to be carefully noted.

20. Thorax: -

(a) Walls, ribs, cartilages

(b) Pleura

(c) Larynx, Trachea and bronchi

(d) Right Lung with weight

(e) Left Lung with weight

(f) Pericardium

(g) Heart with weight

(h) Large vessels

(i) Additional remarks

21. Abdomen: -

(a) Walls -

(b) Peritoneum -

(c) Cavity-

(d) Buccal cavity, teeth, tongue and pharynx-

(e) Oesophagus-

(f) Stomach and its contents-

(g) Small intestine and its contents-

(h) Large intestine and its contents-

(i) Liver and gall bladder with weight-

(j) Pancreas and suprarenals-

(k) Spleen with weight.

(l) Kidneys with weights

(m) Bladder-

(o) Organ of generation-

(p) Additional remarks with, wherever possible, Medical Officer's deduction from the state of contents of the stomach as to the time of death and last meal.

(q) State which viscera, (if any) have been retained for chemical examination and also quote the numbers on the bottles containing the same-

22. Spine and spinal cord-

23. a) Whether the ante-mortem injuries found on the dead body were sufficient in the ordinary course of nature to cause death?

(b) If yes, which of the injuries were individually sufficient in the ordinary course of nature to cause death?

(c) Which of the injuries collectively are sufficient in the ordinary course of nature to cause death?

Opinion as to the probable/Final cause of death: -

Sign
Name of Doctor and seal

PM no:
Dated:

*The spinal cord need not be examined unless there are any indications of disease, strychnine poisoning or injury.
Note: - The report must be written and signed immediately after the examination. Medical officers will at once dispatch a duplicate copy to the Civil Surgeon of their district for in his office.
Great care should be taken not to cut viscera before they have been inspected in *Situ.*

Post Mortem No. :- , Dated:

1. Place:

Forwarded to the **,** P.S. for information with reference to his No. / of Dated: .

2. Viscera has been/ **not** been preserved.

Sign
Name of Doctor and seal

PM no:
Dated:

Indoor/Casualty no: **PM No:**

Hospital: ADR No.:

Police station:

Memorandum of a Post-mortem Examination held at _____ Hospital on the body of **Name** **, Age- Yrs, Sex , Religion** of village/City: Taluka: District**:** by **Dr** /_____ Hospital _____.

I. General Particulars: -

1. (a) By whom was the corpse sent?

   (b) Name of place from which sent.

   (c) Distance of place from which sent.

2. By whom was the corpse brought?

3. By whom identified? i.

   ii

4. (a) The date, hour and minute of its receipt.

   (b)The date, hour and minute of beginning of post mortem Examination

   (c)The date, hour and minute of ending of postmortem examination.

5. Substance of accompanying report from police office or magistrate, together with the date of death, if known. Supposed cause of death or reason, for examination.

6. If not examined at dispensary or hospital-
   (a) Name of place where examined -
   (b) Distance from Dispensary or hospital.
   (c) Reason why the body was not sent to the dispensary or hospital.

II. External Examination: -

7. Sex, apparent age, race or caste, Description of clothes and of ornaments on the body.

8. Condition of the clothes – Whether wet with water, stained with blood or soiled with vomit or faecal matter.

9. Special marks on the skin such as scars, tattooing etc, any malformations peculiarities or other marks of identification. State of the teeth.

   In newly-born infants: -
   The length and (if possible), the weight of the body is to be recorded together with the state of the hair, nails and umbilical cord, its length, whether placenta is attached or not, and if present, its size and condition.

10. Condition of Body- Whether well nourished, thin or emaciated warm or cold.

11. Rigor Mortis- Well-marked, slight or absent whether present

12. Extent and signs of decomposition, presence or post-mortem lividity of buttocks, loins, back and things or any other part. Whether bullae present and the nature of the it contains fluid, condition of the cuticle.
13. Feature- Whether natural or swollen, state of eyes, position of tongue; nature of fluid (if any) oozing from mouth, nostrils or ears.
14. Conditions of skin etc.
In suspected drowning the presence or absence of cutes anserine is to be noted.
15. Injuries to external genitals.
Indication of purging.

16. Position of limbs- Especially of arms and of Fingers or on the skin of hands and feet.

17. Surface wounds, and injuries- Their nature, position, dimensions(measured) and directions to be accurately stated- their probable age and causes to be noted.
If bruises be present, what is the condition of the subcutaneous tissues?
(N.B- When injuries are numerous and cannot be mentioned within the space available they should be mentioned on a separate paper which should be signed.)

18. Other injuries discovered by external examination or palpation of fractures etc.
18a. Can you say definitely that the injuries shown against serial nos. 17 and 18 are ***ante-mortem injuries?***

III. Internal Examination: -

19. Head: -

(i) Injuries under the scalp and their nature.

(ii) Skull: vault and base-describe fractures their sites, dimensions, direction etc.

(iii) Brain: The appearance of its Coverings, size, weight and general condition of the organ itself and any abnormality found in its examination to be carefully noted.

20. Thorax: -

(a) Walls, ribs, cartilages

(b) Pleura

(c) Larynx, Trachea and bronchi

(d) Right Lung with weight

(e) Left Lung with weight

(f) Pericardium

(g) Heart with weight

(h) Large vessels

(i) Additional remarks

21. Abdomen: -

(a) Walls -

(b) Peritoneum -

(c) Cavity-

(d) Buccal cavity, teeth, tongue and pharynx-

(e) Oesophagus-

(f) Stomach and its contents-

(g) Small intestine and its contents-

(h) Large intestine and its contents-

(i) Liver and gall bladder with weight-

(j) Pancreas and suprarenals-

(k) Spleen with weight.

(l) Kidneys with weights

(m) Bladder-

(o) Organ of generation-

(p) Additional remarks with, wherever possible, Medical Officer's deduction from the state of contents of the stomach as to the time of death and last meal.

(q) State which viscera, (if any) have been retained for chemical examination and also quote the numbers on the bottles containing the same-

22. Spine and spinal cord-

23. a) Whether the ante-mortem injuries found on the dead body were sufficient in the ordinary course of nature to cause death?

(b) If yes, which of the injuries were individually sufficient in the ordinary course of nature to cause death?

(c) Which of the injuries collectively are sufficient in the ordinary course of nature to cause death?

Opinion as to the probable/Final cause of death: -

Sign
Name of Doctor and seal

PM no:
Dated:

*The spinal cord need not be examined unless there are any indications of disease, strychnine poisoning or injury.
Note: - The report must be written and signed immediately after the examination. Medical officers will at once dispatch a duplicate copy to the Civil Surgeon of their district for in his office.
Great care should be taken not to cut viscera before they have been inspected in *Situ.*

Post Mortem No. :- , Dated:

1. Place:

Forwarded to the **,** P.S. for information with reference to his No. / of Dated: .

2. Viscera has been/ **not** been preserved.

Sign
Name of Doctor and seal

PM no:
Dated:

Indoor/Casualty no: **PM No:**

Hospital: ADR No.:

Police station:

Memorandum of a Post-mortem Examination held at _____ Hospital on the body of **Name** **, Age- Yrs, Sex , Religion**

of village/City: Taluka: District**:**

by **Dr** /_____ Hospital _____.

I. General Particulars: -

1. (a) By whom was the corpse sent?

   (b) Name of place from which sent.

   (c) Distance of place from which sent.

2. By whom was the corpse brought?

3. By whom identified? i.

   ii

4. (a) The date, hour and minute of its receipt.

   (b)The date, hour and minute of beginning of post mortem Examination

   (c)The date, hour and minute of ending of postmortem examination.

5. Substance of accompanying report from police office or magistrate, together with the date of death, if known. Supposed cause of death or reason, for examination.

6. If not examined at dispensary or hospital-

   (a) Name of place where examined -

   (b) Distance from Dispensary or hospital.

   (c) Reason why the body was not sent to the dispensary or hospital.

II. External Examination: -

7. Sex, apparent age, race or caste, Description of clothes and of ornaments on the body.

8. Condition of the clothes – Whether wet with water, stained with blood or soiled with vomit or faecal matter.

9. Special marks on the skin such as scars, tattooing etc, any malformations peculiarities or other marks of identification. State of the teeth.

   In newly-born infants: -

   The length and (if possible), the weight of the body is to be recorded together with the state of the hair, nails and umbilical cord, its length, whether placenta is attached or not, and if present, its size and condition.

10. Condition of Body- Whether well nourished, thin or emaciated warm or cold.

11. Rigor Mortis- Well-marked, slight or absent whether present

12. Extent and signs of decomposition, presence or post-mortem lividity of buttocks, loins, back and things or any other part. Whether bullae present and the nature of the it contains fluid, condition of the cuticle.
13. Feature- Whether natural or swollen, state of eyes, position of tongue; nature of fluid (if any) oozing from mouth, nostrils or ears.
14. Conditions of skin etc.
In suspected drowning the presence or absence of cutes anserine is to be noted.
15. Injuries to external genitals.
Indication of purging.

16. Position of limbs- Especially of arms and of Fingers or on the skin of hands and feet.

17. Surface wounds, and injuries- Their nature, position, dimensions(measured) and directions to be accurately stated- their probable age and causes to be noted.
If bruises be present, what is the condition of the subcutaneous tissues?
(N.B- When injuries are numerous and cannot be mentioned within the space available they should be mentioned on a separate paper which should be signed.)

18. Other injuries discovered by external examination or palpation of fractures etc.
18a. Can you say definitely that the injuries shown against serial nos. 17 and 18 are ***ante-mortem injuries?***

III. Internal Examination: -

19. Head: -

(i) Injuries under the scalp and their nature.

(ii) Skull: vault and base-describe fractures their sites, dimensions, direction etc.

(iii) Brain: The appearance of its Coverings, size, weight and general condition of the organ itself and any abnormality found in its examination to be carefully noted.

20. Thorax: -

(a) Walls, ribs, cartilages

(b) Pleura

(c) Larynx, Trachea and bronchi

(d) Right Lung with weight

(e) Left Lung with weight

(f) Pericardium

(g) Heart with weight

(h) Large vessels

(i) Additional remarks

21. Abdomen: -

(a) Walls -

(b) Peritoneum -

(c) Cavity-

(d) Buccal cavity, teeth, tongue and pharynx-

(e) Oesophagus-

(f) Stomach and its contents-

(g) Small intestine and its contents-

(h) Large intestine and its contents-

(i) Liver and gall bladder with weight-

(j) Pancreas and suprarenals-

(k) Spleen with weight.

(l) Kidneys with weights

(m) Bladder-

(o) Organ of generation-

(p) Additional remarks with, wherever possible, Medical Officer's deduction from the state of contents of the stomach as to the time of death and last meal.

(q) State which viscera, (if any) have been retained for chemical examination and also quote the numbers on the bottles containing the same-

22. Spine and spinal cord-

23. a) Whether the ante-mortem injuries found on the dead body were sufficient in the ordinary course of nature to cause death?

(b) If yes, which of the injuries were individually sufficient in the ordinary course of nature to cause death?

(c) Which of the injuries collectively are sufficient in the ordinary course of nature to cause death?

Opinion as to the probable/Final cause of death: -

Sign
Name of Doctor and seal

PM no:
Dated:

*The spinal cord need not be examined unless there are any indications of disease, strychnine poisoning or injury.
Note: - The report must be written and signed immediately after the examination. Medical officers will at once dispatch a duplicate copy to the Civil Surgeon of their district for in his office.
Great care should be taken not to cut viscera before they have been inspected in *Situ.*

Post Mortem No. :- , Dated:

1. Place:

Forwarded to the **,** P.S. for information with reference to his No. / of Dated: .

2. Viscera has been/ **not** been preserved.

Sign
Name of Doctor and seal

PM no:
Dated:

Indoor/Casualty no: **PM No:**

Hospital: ADR No.:

Police station:

Memorandum of a Post-mortem Examination held at _____ Hospital on the body of **Name** **, Age- Yrs, Sex , Religion**

of village/City: Taluka: District**:**

by **Dr** /_____ Hospital _____.

I. General Particulars: -

1. (a) By whom was the corpse sent?

   (b) Name of place from which sent.

   (c) Distance of place from which sent.

2. By whom was the corpse brought?

3. By whom identified? i.

   ii

4. (a) The date, hour and minute of its receipt.

   (b)The date, hour and minute of beginning of post mortem Examination

   (c)The date, hour and minute of ending of postmortem examination.

5. Substance of accompanying report from police office or magistrate, together with the date of death, if known. Supposed cause of death or reason, for examination.

6. If not examined at dispensary or hospital-

   (a) Name of place where examined -

   (b) Distance from Dispensary or hospital.

   (c) Reason why the body was not sent to the dispensary or hospital.

II. External Examination: -

7. Sex, apparent age, race or caste, Description of clothes and of ornaments on the body.

8. Condition of the clothes – Whether wet with water, stained with blood or soiled with vomit or faecal matter.

9. Special marks on the skin such as scars, tattooing etc, any malformations peculiarities or other marks of identification. State of the teeth.

   In newly-born infants: -

   The length and (if possible), the weight of the body is to be recorded together with the state of the hair, nails and umbilical cord, its length, whether placenta is attached or not, and if present, its size and condition.

10. Condition of Body- Whether well nourished, thin or emaciated warm or cold.

11. Rigor Mortis- Well-marked, slight or absent whether present

12. Extent and signs of decomposition, presence or post-mortem lividity of buttocks, loins, back and things or any other part. Whether bullae present and the nature of the it contains fluid, condition of the cuticle.
13. Feature- Whether natural or swollen, state of eyes, position of tongue; nature of fluid (if any) oozing from mouth, nostrils or ears.
14. Conditions of skin etc.
In suspected drowning the presence or absence of cutes anserine is to be noted.
15. Injuries to external genitals.
Indication of purging.

16. Position of limbs- Especially of arms and of Fingers or on the skin of hands and feet.

17. Surface wounds, and injuries- Their nature, position, dimensions(measured) and directions to be accurately stated- their probable age and causes to be noted.
If bruises be present, what is the condition of the subcutaneous tissues?
(N.B- When injuries are numerous and cannot be mentioned within the space available they should be mentioned on a separate paper which should be signed.)

18. Other injuries discovered by external examination or palpation of fractures etc.
18a. Can you say definitely that the injuries shown against serial nos. 17 and 18 are ***ante-mortem injuries?***

III. Internal Examination: -

19. Head: -

(i) Injuries under the scalp and their nature.

(ii) Skull: vault and base-describe fractures their sites, dimensions, direction etc.

(iii) Brain: The appearance of its Coverings, size, weight and general condition of the organ itself and any abnormality found in its examination to be carefully noted.

20. Thorax: -

(a) Walls, ribs, cartilages

(b) Pleura

(c) Larynx, Trachea and bronchi

(d) Right Lung with weight

(e) Left Lung with weight

(f) Pericardium

(g) Heart with weight

(h) Large vessels

(i) Additional remarks

21. Abdomen: -

(a) Walls -

(b) Peritoneum -

(c) Cavity-

(d) Buccal cavity, teeth, tongue and pharynx-

(e) Oesophagus-

(f) Stomach and its contents-

(g) Small intestine and its contents-

(h) Large intestine and its contents-

(i) Liver and gall bladder with weight-

(j) Pancreas and suprarenals-

(k) Spleen with weight.

(l) Kidneys with weights

(m) Bladder-

(o) Organ of generation-

(p) Additional remarks with, wherever possible, Medical Officer's deduction from the state of contents of the stomach as to the time of death and last meal.

(q) State which viscera, (if any) have been retained for chemical examination and also quote the numbers on the bottles containing the same-

22. Spine and spinal cord-

23. a) Whether the ante-mortem injuries found on the dead body were sufficient in the ordinary course of nature to cause death?

(b) If yes, which of the injuries were individually sufficient in the ordinary course of nature to cause death?

(c) Which of the injuries collectively are sufficient in the ordinary course of nature to cause death?

Opinion as to the probable/Final cause of death: -

Sign
Name of Doctor and seal

PM no:
Dated:

*The spinal cord need not be examined unless there are any indications of disease, strychnine poisoning or injury.
Note: - The report must be written and signed immediately after the examination. Medical officers will at once dispatch a duplicate copy to the Civil Surgeon of their district for in his office.
Great care should be taken not to cut viscera before they have been inspected in *Situ.*

Post Mortem No. :- , Dated:

1. Place:
Forwarded to the **,** P.S. for information with reference to his No. / of Dated: .

2. Viscera has been/ **not** been preserved.

Sign
Name of Doctor and seal

PM no:
Dated:

Indoor/Casualty no: **PM No:**

Hospital: ADR No.:

Police station:

Memorandum of a Post-mortem Examination held at _____ Hospital on the body of **Name** **, Age- Yrs, Sex , Religion**

of village/City: Taluka: District**:**

by **Dr** /_____ Hospital _____.

I. General Particulars: -

1. (a) By whom was the corpse sent?

   (b) Name of place from which sent.

   (c) Distance of place from which sent.

2. By whom was the corpse brought?

3. By whom identified? i.

   ii

4. (a) The date, hour and minute of its receipt.

   (b)The date, hour and minute of beginning of post mortem Examination

   (c)The date, hour and minute of ending of postmortem examination.

5. Substance of accompanying report from police office or magistrate, together with the date of death, if known. Supposed cause of death or reason, for examination.

6. If not examined at dispensary or hospital-

   (a) Name of place where examined -

   (b) Distance from Dispensary or hospital.

   (c) Reason why the body was not sent to the dispensary or hospital.

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8. Condition of the clothes – Whether wet with water, stained with blood or soiled with vomit or faecal matter.

9. Special marks on the skin such as scars, tattooing etc, any malformations peculiarities or other marks of identification. State of the teeth.

   In newly-born infants: -

   The length and (if possible), the weight of the body is to be recorded together with the state of the hair, nails and umbilical cord, its length, whether placenta is attached or not, and if present, its size and condition.

10. Condition of Body- Whether well nourished, thin or emaciated warm or cold.

11. Rigor Mortis- Well-marked, slight or absent whether present

12. Extent and signs of decomposition, presence or post-mortem lividity of buttocks, loins, back and things or any other part. Whether bullae present and the nature of the it contains fluid, condition of the cuticle.
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In suspected drowning the presence or absence of cutes anserine is to be noted.
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Indication of purging.

16. Position of limbs- Especially of arms and of Fingers or on the skin of hands and feet.

17. Surface wounds, and injuries- Their nature, position, dimensions(measured) and directions to be accurately stated- their probable age and causes to be noted.
If bruises be present, what is the condition of the subcutaneous tissues?
(N.B- When injuries are numerous and cannot be mentioned within the space available they should be mentioned on a separate paper which should be signed.)

18. Other injuries discovered by external examination or palpation of fractures etc.
18a. Can you say definitely that the injuries shown against serial nos. 17 and 18 are ***ante-mortem injuries?***

III. Internal Examination: -

19. Head: -

(i) Injuries under the scalp and their nature.

(ii) Skull: vault and base-describe fractures their sites, dimensions, direction etc.

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20. Thorax: -

(a) Walls, ribs, cartilages

(b) Pleura

(c) Larynx, Trachea and bronchi

(d) Right Lung with weight

(e) Left Lung with weight

(f) Pericardium

(g) Heart with weight

(h) Large vessels

(i) Additional remarks

21. Abdomen: -

(a) Walls -

(b) Peritoneum -

(c) Cavity-

(d) Buccal cavity, teeth, tongue and pharynx-

(e) Oesophagus-

(f) Stomach and its contents-

(g) Small intestine and its contents-

(h) Large intestine and its contents-

(i) Liver and gall bladder with weight-

(j) Pancreas and suprarenals-

(k) Spleen with weight.

(l) Kidneys with weights

(m) Bladder-

(o) Organ of generation-

(p) Additional remarks with, wherever possible, Medical Officer's deduction from the state of contents of the stomach as to the time of death and last meal.

(q) State which viscera, (if any) have been retained for chemical examination and also quote the numbers on the bottles containing the same-

22. Spine and spinal cord-

23. a) Whether the ante-mortem injuries found on the dead body were sufficient in the ordinary course of nature to cause death?

(b) If yes, which of the injuries were individually sufficient in the ordinary course of nature to cause death?

(c) Which of the injuries collectively are sufficient in the ordinary course of nature to cause death?

Opinion as to the probable/Final cause of death: -

Sign
Name of Doctor and seal

PM no:
Dated:

*The spinal cord need not be examined unless there are any indications of disease, strychnine poisoning or injury.
Note: - The report must be written and signed immediately after the examination. Medical officers will at once dispatch a duplicate copy to the Civil Surgeon of their district for in his office.
Great care should be taken not to cut viscera before they have been inspected in *Situ.*

Post Mortem No. :- , Dated:

1. Place:

Forwarded to the **,** P.S. for information with reference to his No. / of Dated: .

2. Viscera has been/ **not** been preserved.

Sign
Name of Doctor and seal

PM no:
Dated:

Indoor/Casualty no: **PM No:**

Hospital: ADR No.:

Police station:

Memorandum of a Post-mortem Examination held at _____ Hospital on the body of **Name** **, Age- Yrs, Sex , Religion**

of village/City: Taluka: District**:**

by **Dr** /_____ Hospital _____.

I. General Particulars: -

1. (a) By whom was the corpse sent?

   (b) Name of place from which sent.

   (c) Distance of place from which sent.

2. By whom was the corpse brought?

3. By whom identified? i.

   ii

4. (a) The date, hour and minute of its receipt.

   (b)The date, hour and minute of beginning of post mortem Examination

   (c)The date, hour and minute of ending of postmortem examination.

5. Substance of accompanying report from police office or magistrate, together with the date of death, if known. Supposed cause of death or reason, for examination.

6. If not examined at dispensary or hospital-

   (a) Name of place where examined -

   (b) Distance from Dispensary or hospital.

   (c) Reason why the body was not sent to the dispensary or hospital.

II. External Examination: -

7. Sex, apparent age, race or caste, Description of clothes and of ornaments on the body.

8. Condition of the clothes – Whether wet with water, stained with blood or soiled with vomit or faecal matter.

9. Special marks on the skin such as scars, tattooing etc, any malformations peculiarities or other marks of identification. State of the teeth.

In newly-born infants: -

The length and (if possible), the weight of the body is to be recorded together with the state of the hair, nails and umbilical cord, its length, whether placenta is attached or not, and if present, its size and condition.

10. Condition of Body- Whether well nourished, thin or emaciated warm or cold.

11. Rigor Mortis- Well-marked, slight or absent whether present

12. Extent and signs of decomposition, presence or post-mortem lividity of buttocks, loins, back and things or any other part. Whether bullae present and the nature of the it contains fluid, condition of the cuticle.
13. Feature- Whether natural or swollen, state of eyes, position of tongue; nature of fluid (if any) oozing from mouth, nostrils or ears.
14. Conditions of skin etc.
In suspected drowning the presence or absence of cutes anserine is to be noted.
15. Injuries to external genitals.
Indication of purging.

16. Position of limbs- Especially of arms and of Fingers or on the skin of hands and feet.

17. Surface wounds, and injuries- Their nature, position, dimensions(measured) and directions to be accurately stated- their probable age and causes to be noted.
If bruises be present, what is the condition of the subcutaneous tissues?
(N.B- When injuries are numerous and cannot be mentioned within the space available they should be mentioned on a separate paper which should be signed.)

18. Other injuries discovered by external examination or palpation of fractures etc.
18a. Can you say definitely that the injuries shown against serial nos. 17 and 18 are ***ante-mortem injuries?***

III. Internal Examination: -

19. Head: -

(i) Injuries under the scalp and their nature.

(ii) Skull: vault and base-describe fractures their sites, dimensions, direction etc.

(iii) Brain: The appearance of its Coverings, size, weight and general condition of the organ itself and any abnormality found in its examination to be carefully noted.

20. Thorax: -

(a) Walls, ribs, cartilages

(b) Pleura

(c) Larynx, Trachea and bronchi

(d) Right Lung with weight

(e) Left Lung with weight

(f) Pericardium

(g) Heart with weight

(h) Large vessels

(i) Additional remarks

21. Abdomen: -

(a) Walls -

(b) Peritoneum -

(c) Cavity-

(d) Buccal cavity, teeth, tongue and pharynx-

(e) Oesophagus-

(f) Stomach and its contents-

(g) Small intestine and its contents-

(h) Large intestine and its contents-

(i) Liver and gall bladder with weight-

(j) Pancreas and suprarenals-

(k) Spleen with weight.

(l) Kidneys with weights

(m) Bladder-

(o) Organ of generation-

(p) Additional remarks with, wherever possible, Medical Officer's deduction from the state of contents of the stomach as to the time of death and last meal.

(q) State which viscera, (if any) have been retained for chemical examination and also quote the numbers on the bottles containing the same-

22. Spine and spinal cord-

23. a) Whether the ante-mortem injuries found on the dead body were sufficient in the ordinary course of nature to cause death?

(b) If yes, which of the injuries were individually sufficient in the ordinary course of nature to cause death?

(c) Which of the injuries collectively are sufficient in the ordinary course of nature to cause death?

Opinion as to the probable/Final cause of death: -

Sign
Name of Doctor and seal

PM no:
Dated:

*The spinal cord need not be examined unless there are any indications of disease, strychnine poisoning or injury.
Note: - The report must be written and signed immediately after the examination. Medical officers will at once dispatch a duplicate copy to the Civil Surgeon of their district for in his office.
Great care should be taken not to cut viscera before they have been inspected in *Situ.*

Post Mortem No. :- , Dated:

1. Place:

Forwarded to the **,** P.S. for information with reference to his No. / of Dated: .

2. Viscera has been/ **not** been preserved.

Sign
Name of Doctor and seal

PM no:
Dated:

Indoor/Casualty no: **PM No:**

Hospital: ADR No.:

Police station:

Memorandum of a Post-mortem Examination held at _____ Hospital on the body of **Name** **, Age- Yrs, Sex , Religion**

of village/City: Taluka: District**:**

by **Dr** /_____ Hospital _____.

I. General Particulars: -

1. (a) By whom was the corpse sent?

   (b) Name of place from which sent.

   (c) Distance of place from which sent.

2. By whom was the corpse brought?

3. By whom identified? i.

   ii

4. (a) The date, hour and minute of its receipt.

   (b)The date, hour and minute of beginning of post mortem Examination

   (c)The date, hour and minute of ending of postmortem examination.

5. Substance of accompanying report from police office or magistrate, together with the date of death, if known. Supposed cause of death or reason, for examination.

6. If not examined at dispensary or hospital-

   (a) Name of place where examined -

   (b) Distance from Dispensary or hospital.

   (c) Reason why the body was not sent to the dispensary or hospital.

II. External Examination: -

7. Sex, apparent age, race or caste, Description of clothes and of ornaments on the body.

8. Condition of the clothes – Whether wet with water, stained with blood or soiled with vomit or faecal matter.

9. Special marks on the skin such as scars, tattooing etc, any malformations peculiarities or other marks of identification. State of the teeth.

In newly-born infants: -

The length and (if possible), the weight of the body is to be recorded together with the state of the hair, nails and umbilical cord, its length, whether placenta is attached or not, and if present, its size and condition.

10. Condition of Body- Whether well nourished, thin or emaciated warm or cold.

11. Rigor Mortis- Well-marked, slight or absent whether present

12. Extent and signs of decomposition, presence or post-mortem lividity of buttocks, loins, back and things or any other part. Whether bullae present and the nature of the it contains fluid, condition of the cuticle.
13. Feature- Whether natural or swollen, state of eyes, position of tongue; nature of fluid (if any) oozing from mouth, nostrils or ears.
14. Conditions of skin etc.
In suspected drowning the presence or absence of cutes anserine is to be noted.
15. Injuries to external genitals.
Indication of purging.

16. Position of limbs- Especially of arms and of Fingers or on the skin of hands and feet.

17. Surface wounds, and injuries- Their nature, position, dimensions(measured) and directions to be accurately stated- their probable age and causes to be noted.
If bruises be present, what is the condition of the subcutaneous tissues?
(N.B- When injuries are numerous and cannot be mentioned within the space available they should be mentioned on a separate paper which should be signed.)

18. Other injuries discovered by external examination or palpation of fractures etc.
18a. Can you say definitely that the injuries shown against serial nos. 17 and 18 are ***ante-mortem injuries?***

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19. Head: -

(i) Injuries under the scalp and their nature.

(ii) Skull: vault and base-describe fractures their sites, dimensions, direction etc.

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(a) Walls, ribs, cartilages

(b) Pleura

(c) Larynx, Trachea and bronchi

(d) Right Lung with weight

(e) Left Lung with weight

(f) Pericardium

(g) Heart with weight

(h) Large vessels

(i) Additional remarks

21. Abdomen: -

(a) Walls -

(b) Peritoneum -

(c) Cavity-

(d) Buccal cavity, teeth, tongue and pharynx-

(e) Oesophagus-

(f) Stomach and its contents-

(g) Small intestine and its contents-

(h) Large intestine and its contents-

(i) Liver and gall bladder with weight-

(j) Pancreas and suprarenals-

(k) Spleen with weight.

(l) Kidneys with weights

(m) Bladder-

(o) Organ of generation-

(p) Additional remarks with, wherever possible, Medical Officer's deduction from the state of contents of the stomach as to the time of death and last meal.

(q) State which viscera, (if any) have been retained for chemical examination and also quote the numbers on the bottles containing the same-

22. Spine and spinal cord-

23. a) Whether the ante-mortem injuries found on the dead body were sufficient in the ordinary course of nature to cause death?

(b) If yes, which of the injuries were individually sufficient in the ordinary course of nature to cause death?

(c) Which of the injuries collectively are sufficient in the ordinary course of nature to cause death?

Opinion as to the probable/Final cause of death: -

Sign
Name of Doctor and seal

PM no:
Dated:

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Note: - The report must be written and signed immediately after the examination. Medical officers will at once dispatch a duplicate copy to the Civil Surgeon of their district for in his office.
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Post Mortem No. :- , Dated:

1. Place:

Forwarded to the **,** P.S. for information with reference to his No. / of Dated: .

2. Viscera has been/ **not** been preserved.

Sign
Name of Doctor and seal

PM no:
Dated:

Indoor/Casualty no: **PM No:**

Hospital: ADR No.:

Police station:

Memorandum of a Post-mortem Examination held at _____ Hospital on the body of **Name** **, Age- Yrs, Sex , Religion**

of village/City: Taluka: District**:**

by **Dr** /_____ Hospital _____.

I. General Particulars: -

1. (a) By whom was the corpse sent?

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(f) Pericardium

(g) Heart with weight

(h) Large vessels

(i) Additional remarks

21. Abdomen: -

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(b) Peritoneum -

(c) Cavity-

(d) Buccal cavity, teeth, tongue and pharynx-

(e) Oesophagus-

(f) Stomach and its contents-

(g) Small intestine and its contents-

(h) Large intestine and its contents-

(i) Liver and gall bladder with weight-

(j) Pancreas and suprarenals-

(k) Spleen with weight.

(l) Kidneys with weights

(m) Bladder-

(o) Organ of generation-

(p) Additional remarks with, wherever possible, Medical Officer's deduction from the state of contents of the stomach as to the time of death and last meal.

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Opinion as to the probable/Final cause of death: -

Sign
Name of Doctor and seal

PM no:
Dated:

*The spinal cord need not be examined unless there are any indications of disease, strychnine poisoning or injury.
Note: - The report must be written and signed immediately after the examination. Medical officers will at once dispatch a duplicate copy to the Civil Surgeon of their district for in his office.
Great care should be taken not to cut viscera before they have been inspected in *Situ.*

Post Mortem No. :- , Dated:

1. Place:

Forwarded to the **,** P.S. for information with reference to his No. / of Dated: .

2. Viscera has been/ **not** been preserved.

Sign
Name of Doctor and seal

PM no:
Dated:

Part- IV

Common Medico-legal proforma routinely used in medico-legal Practice

Form in which to report post mortem examination to be used when forwarding Viscera to the Chemical Analyser

From:
TO
THE CHEMICAL ANALYSER TO GOVERNMENT OF MAHARASHTRA, _____

Date: _____

Description of Viscera forwarded for examination:

Mode of packing: Box No. Bottle No. Weight of parcel		Copy of the label attached to bottle Impression of Seal
Mode of dispatch	Date of Dispatch	

Information furnished by police officer or precis of case :

Name: Sex: Age: Caste:

Thana or village:

Story of the case -

Date and hour of dispatch of body Date of receipt	Date and hour of autopsy	Names of officer by whom Examination was actually made

Appearance of Body –

Muscularity: Stout: Emaciated:

Special Marks:-

Scars: Tattooing: Amount of Hairs etc.

Signs of decomposition:-

Wounds and bruises:

(a) Position: (b) Character: (c) Size:

State of natural orifices:

Nostrils: Mouth: Vagina:

Anus: Urethra:

State of limbs etc.

Rigor mortis: Position:

Contents of hands if clenched:

Feature	Relaxed
	Contracted

Eyelids: Pupils: Contents of mouth:

Position of tongue: State of teeth:

Thorax -

Ribs: Cartilages: Pleura: Pericardium:

Heart: Shape and appearance

Cavities

Clots ante or post-mortem

Muscular structure

Vessels: Clots
Aneurysm
Atheroma

Lungs : Appearance
Colour
Consistence
Adhesions

Larynx, trachea and bronchi for foreign bodies or disease:

Abdomen: -

Peritoneum

Peritoneal cavity, contents

Liver and gall bladder -form and size, disease or injury

Pancreas disease or injury

Spleen disease or injury

Kidney disease or injury

Stomach Size and general appearance
Appearance of coats
Contents, appearance, odour and quantity.

Intestine Size and general appearance
Appearance of coats

General Organs: -

Bladder and contents

Uterus appearance, size and contents

Vagina, contents

Head:

Scalp

Bones, Disease or Injury

Membranes

Brain substance and ventricles

Base of skull fracture, caries, extravasations, etc.

The Spinal cord need not be examined unless any indication of disease or injury exists.

Fracture and dislocation

More detailed description of injury or disease

Opinion as to the cause of death: -

Station

Date Civil Surgeon / Medical Officer in Charge / Autopsy Surgeon

Form No II

Form or report to be used when forwarding substance Other than viscera to the chemical analyser

From:

To
THE CHEMICAL ANALYSER
GOVERNMENT OF MAHARASHTRA,

_____

Dated: / /

Forwarding the article mentioned below for examination for _____

_____ In connection with the case of_____

Description of Articles

Mode of packing and weight of parcel If standard boxes and bottles are used a) Box No. b) Bottle No.	Copy of the label attached to bottle
Mode of Dispatch Date Date:	Date of receipt in Chemical Analyzer's office

Facts of Medico legal importance in connection with case:

Station

Date Civil Surgeon / Medical Officer in Charge / Autopsy Surgeon

Form for Dispatch of Viscera for Histopathological Examination

TO,
HOD / In-charge,
Histopathology Section,
Department of Pathology,

_____, _____ .

(Through: _____)

Subject : **Regarding Histopathological examination and report.**

Reference : MLPM No._____ Date: _____

Name of deceased: _____

Age: _____ Sex: _____

Hospital Reg./MLC No_____ Ward: _____

DOA & Time _____ DOD & Time _____

Nature Of specimen:

Preservative Used:

Clinical Details:

Clinical Diagnosis:

Autopsy findings in brief:

Probable cause of death on Autopsy:

Special instruction, if any: -

Place: Signature
Date & Time: Name of Doctor
Designation & seal

✂- - - -

Labels for Viscera Bottles

Bottle No. 1

Name of the Hospital: _____

P.M. No: _____ **Date:** _____

Name of Deceased: _____

Police Station: _____

Nature of Specimen: _____

Preservative Used: _____

Date: _____ **Autopsy Surgeon**

Place: _____ *Sign & seal*

✂- - - -

Instructions for Forwarding Blood/Tissue For DNA Fingerprinting/ Paternity Testing.

1. Medical officer should collect fresh blood in 2 ml plastic tubes (2 blood samples from each person) provided by Regional Forensic Science Laboratory.

2. Please shake the tube for 7-8 times after collecting blood.

3. Duly labelled tube should be kept in sterile plastic bottle which should be immediately sealed.

4. Duly filled IDENTIFICATION FORM should be sent along with the sample.

5. COPY OF SEAL should be provided at the end of IDENTIFICATION FORM.

6. For each person, a separate IDENTIFICATION FORM should be filled by Medical Officer while forwarding samples for DNA profiling.

7. Photograph of person on IDENTIFICATION FORM should be duly signed and attested by the Medical Officer.

8. IDENTIFICATION FORM should be signed by Witnesses in front of Medical Officer.

9. The samples should be sent to the Regional Forensic Science Laboratory in ice box with ice, if more than 4 Hours are required to submit the samples.

10. Products of abortion/ other tissue should be sealed in a sterile plastic bottle and sent to the Regional Forensic Science Laboratory in ice box with ice. If available, 4% EDTA could be used as preservative.

11. Don’t use formalin or other preservatives. Formalin preserved samples are considered unacceptable/ inappropriate for DNA analysis by Forensic Science Laboratories.

12. In case of blood transfusion to donor within last three months, blood sample should not be collected. In such case, donor’s blood sample should be collected after four months of blood transfusion.

Identification form for forwarding samples for DNA Fingerprinting/ Profiling

To
Deputy Director,
Regional Forensic Science Laboratory,
State of Maharashtra, _____.

Prefix photograph.

Photograph to be attested by Medical Officer

IDENTIFICATION FORM

Name : _____
Age: _____Sex: _____
Father's / Husband's / Guardian's Name :_____
Address (with Tel. No. Fax. If any):_____
Description of sample : _____
Genetic abnormalities, if any (specify): _____
Date and Time of Sample collection :- Date:_____ Time:_____
Forwarded by:
(a) Hon'ble Court of / Police Station :_____
(b) C. R. No. /FIR/Case /MC/OP No., etc. : _____

DECLARATION BY DONOR
(OR BY GUARDIAN IN CASE OF MINOR DONOR)

I, _____hereby declare that the blood given by me / my ward to Regional Forensic Science Laboratory, State of Maharashtra, _____ is with my consent and I / my ward did not receive a blood transfusion within last three months.
(This consent is explained to patient in _____language)

Signature/Thumb impression
(Subject/Guardian)

The blood is collected in presence of following witnesses:

(1) Name: _____Signature: _____

(2) Name: _____Signature: _____

Copy of Seal

Sign. and designation of M.O. with Stamp

- STRIKE OUT WHICHEVER NOT APPLICABLE,
- IN CASE OF BLOOD TRANSFUSION TO DONOR WITHIN LAST THREE MONTHS, BLOOD SAMPLE SHOULD NOT BE COLLECTED.
- PASSPORT SIZE PHOTOGRAPH TO BE ATTESTED BY MEDICAL OFFICER.

Summons to Witness

In the District & Sessions Court

At

Session Case No. _____of 20

Summon to witness

To,

Whereas complaint has been made before me that_____

Of _____

has committed the offence of _____

on or above the _____day of _____20____at _____

and it appears to me that you are likely to give material evidence for the _____

You are hereby summoned to appear before this court on the _____day _____

at_____ hours to_____

testify what you know concerning the matter of the said complaint, and not to depart thence, without leave of the court, and you are hereby warned that if you shall, without just excuse neglect or refuse to appear at the said time and place a warrant will be issued to compel your attendance.

Given under my hand and the seal of the court this _____day of _____20_____

Superintendent

(By order of Session Judge)

Second MBBS (from October 2020)

Subject: Microbiology Theory / Practical

Based on Medical Council of India, Competency based Undergraduate curriculum for the Indian Medical Graduate, 2018. (Vol. 1; page nos. 205-227)

1. Total Teaching hours : **190**
2. A. Lectures(hours): **70**
   B. Self-directed learning (hours):- **10**
   C. Clinical Postings (Hours): NA
   D. Small group teachings/tutorials/Integrated teaching / Practical's (hours)**: 110**

Competency Nos.	**Topics and Subtopics**
MI1.1	Introduction to Microbiology and historical aspects. Introduction to bacteria, viruses & Bacteriophages, fungi, parasites, host parasite relationship, normal flora.
MI1.2	Morphology of bacteria, microscopy, Gram staining, Z-N staining, stool examination- routine microscopy
MI1.3	Types of infection, source/ reservoir of infection, modes of transmission, pathogenicity, definition of prevalence, incidence, types of infectious diseases (endemic, epidemic, pandemic, sporadic)
MI1.4	Methods of sterilization and disinfection, their application in the laboratory, clinical and surgical practice, demonstration of working of autoclave
MI1.5	Choose the most appropriate method of sterilization and disinfection to be used in specific situations in the laboratory, in clinical and surgical practice
MI1.6	Mechanism of drug resistance, methods of antibiotic susceptibility testing, definition of MIC, MBC, break points, interpretation of antibiotic susceptibility test report, antimicrobial audit/use, antibiotic policy, antimicrobial stewardship.
MI1.7	Immunity
MI1.8	Antigen, antibodies, immune response and complement, antigen antibody reactions
MI1.9	Vaccines, universal vaccination program, immunoprophylaxis, immunotherapy

Competency Nos.	Topics and Subtopics
MI1.10	Hypersensitivity, autoimmune disorders and immunodeficiency states, laboratory methods used in their detection
MI1.11	Immunological mechanisms of transplantation and tumor immunity
MI2.1	Rheumatic Heart Disease-definition, etiological agent, pathogenesis, clinical features and laboratory diagnosis. Streptococci
MI2.2	Infective endocarditis- classification, etiological agents, pathogenesis, clinical features and laboratory diagnosis. Streptococcus viridans, Streptococcus mutans, HACEK
MI2.3	Blood collection for culture, throat swab collection, blood culture, ASO test, interpretation of the test
MI2.4	Anemia-definition, etiological agents, pathogenesis, clinical features and laboratory diagnosis. Hookworm, Trichuris trichiura,
MI2.5	Kala azar, malaria, filariasis and other common parasites prevalent in India - *Schistosomes*, ***Fasciolopsis buski,*** *Paragonimus westermani*,
MI2.6	Peripheral smear staining for malaria, Identify the slide for filarial
MI2.7	HIV- epidemiology, the etio- pathogenesis, evolution, complications, opportunistic infections, diagnosis, prevention and the principles of management of HIV
MI3.1	Microbial agents causing diarrhea and dysentery- epidemiology, morphology, pathogenesis, clinical features and laboratory diagnosis of Shigella, Campylobacter, . Vibrio, salmonella, E. hystolytica, Giardia, B. coli, H. nana, Taenia , Intestinal nematodes, Norwalk virus and Rota virus, Coronavirus
MI3.2	Stool examination-routine microscopy, hanging drop preparation,
MI3.3	Septicemia, Enteric fever and Food poisoning Salmonella -Morphology, pathogenesis, clinical features, laboratory diagnosis.
MI3.4	Blood culture, Widal test, Stool culture, Clot culture, Interpretation of the reports
MI3.5	Food poisoning- etiological agents, pathogenesis, clinical features and laboratory diagnosis. Staphylococci, Cl. botulinum, Bacillus cereus
MI3.6	Acid peptic disease (APD)- etio-pathogenesis, clinical course laboratory diagnosis and management H. pylori
MI3.7	Viral hepatitis- etiological agents, pathogenesis, clinical features and laboratory diagnosis. Hepatitis A, B, C, D, E, Cytomegalovirus, Epstein-Barr virus, HSV, VZV, Measles, Rubella
MI3.8	Serological tests for the laboratory diagnosis of viral hepatitis, viral markers, interpretation of reports

Competency Nos.	Topics and Subtopics
MI4.1	Anaerobic infections- etiological agents, pathogenesis, clinical features and laboratory diagnosis. Spore bearing and non-spore bearing anaerobes, Clostridia
MI4.2	Bone and joint infections- etio-pathogenesis, clinical features and laboratory diagnosis. Prosthetic joint infections, Staphylococci, Acinetobacter
MI4.3	Skin and soft tissue infections- etiological agents, pathogenesis, clinical features and laboratory diagnosis. Superficial, cutaneous and sub-cutaneous fungal infections, Mycetoma, Leprosy, Herpes.
MI5.1	Meningitis- etiological agents, pathogenesis, clinical features and laboratory diagnosis. Meningococci, Leisteria, H. influenzae, Cryptococcus neoformans
MI5.2	Encephalitis- etiological agents, pathogenesis, clinical features and laboratory diagnosis. Primary amoebic meningo-encephalitis, viral encephalitis, Japanese encephalitis, Rabies, Aseptic meningitis -ECHO viruses
MI5.3	laboratory diagnosis of meningitis, interpretation of laboratory reports
MI6.1	Upper respiratory tract infections- etiological agents, pathogenesis, clinical features and laboratory diagnosis Orthomyxo virus, Paramyxo virus, Adenovirus, Rhinovirus, Diphtheria, Bordetella and Lower respiratory tract infections-etiological agents, pathogenesis, clinical features and laboratory diagnosis Streptococcus pneumonia, Mycobaterium tuberculosis,
MI6.2	Gram staining- Interpretation of results
MI6.3	Z-N staining and Fluorescent staining- Interpretation of results
MI7.1	Genitourinary infections- etiological agents, pathogenesis, clinical features and laboratory diagnosis. Non-gonococcal urethritis, Trichomoniasis, . Bacterial vaginosis
MI7.2	Sexually transmitted infections- etiological agents, pathogenesis, clinical features and laboratory diagnosis. Syphilis, Gonorrhea, Herpes, Calymmatobacterium, HPV, Molluscum contagiosum
MI7.3	Urinary tract infections- etiological agents, pathogenesis, significant bacteruria , clinical features and laboratory diagnosis. E. coli, Klebsiella, Proteus
MI8.1	Zoonotic diseases- etiological agents, mode of transmission, pathogenesis, clinical features laboratory diagnosis and prevention-Brucella, Yesinia, Leptospira, Anthrax and Arbo viruses, Hydatid disease
MI8.2	Opportunistic infections- etio-pathogenesis, factors contributing to the occurrence of OI, laboratory diagnosis - Toxoplasma, Pneumocystis jiroveci, Cryptospora, Isospora,
MI8.3	Oncogenic viruses in the evolution of virus associated malignancy

Competency Nos.	Topics and Subtopics
MI8.5	Healthcare Associated Infections (HAI)- definition, types, factors that contribute to the development of HAI and the methods for prevention- Pseudomonas, MOTT, Antibiotic associated diarrhea
MI8.6	Hand hygiene, bio medical waste management, environmental hygiene, use of equipments, respiratory hygiene and cough etiquette, PEP, spill management, vaccination
MI8.7	Infection control practices and use of Personal Protective Equipments (PPE)
MI8.8	Microbiology of food, water and air
MI8.9	Methods of sample collection and transport
MI8.10	Collection and transport of specimens
MI8.11	Respect for patient samples sent to the laboratory for performance of laboratory tests
MI8.12	Confidentiality pertaining to patient identity in laboratory results
MI8.13	Appropriate laboratory test in the diagnosis of the infectious disease
MI8.14	Confidentiality pertaining to patient identity in laboratory results
MI8.15	Interpret the results of the laboratory tests used in diagnosis of the infectious disease
MI8.16	National Health Programs in the prevention of common infectious diseases- Vector borne diseases control program, Revised National Tuberculosis Control Program (RNTCP), National AIDS Control Program, National Leprosy Eradication Program, Pulse Polio Program- Poliovirus
Miscellaneous topics - may be covered in theory or SGT	Burkholderia, Mycoplasma, Borrelia, Actinomyses & Nocardia, Rickettsia, Bortonella, Ehrlichia, Chlamydiae, Ebola virus, Slow viruses

AETCOM Module no.	Topics and Subtopics
2.5	Bioethics-patient autonomy and decision making
2.6	Bioethics-patient autonomy and decision making
2.7	Bioethics-patient autonomy and decision making

Revision

Paper wise distribution of topics for Prelim & MUHS Annual Examination
Year: Second MBBS Subject: MICROBIOLOGY

Paper	Section	Topics
I	A	MCQs on all topics of the paper I
		General Microbiology and Immunity
		CVS and Blood
		Gastrointestinal and hepatobiliary system
		AETCOM Module No- 2.5,2.6 and 2.7
II	A	MCQs on all topics of the paper II
		Musculoskeletal system, skin and soft tissue infection
		Central nervous system infections
		Respiratory tract infections
		Genitourinary and sexually transmitted infections
		Zoonotic diseases and miscellaneous

Second MBBS Internal Assessment Subject: Microbiology

Applicable w.e.f October 2020 onwards examination for batches admitted from June 2019 onwards

Phase	IA – 1 -Exam (After 3 months , Jan)			IA – 2 -Exam (After 7 months, May)			Prelims (July)		
	Theory	Practical (Including 10 Marks for Journal & Log Book)	Total Marks	Theory	Practical Including 10 Marks for Journal & Log Book	Total Marks	Theory	Practical	Total Marks
Second MBBS	50	50	100	50	50	100	Paper 1 -100 Paper 2 -100	100	300

Assessment in CBME is ONGOING PRCESS,

No Preparatory leave is permitted.

1. There shall be 3 internal assessment examinations in Microbiology.
2. The suggested patterns of question paper for first two internal assessment theory examinations is given below. Pattern of the prelims examinations should be similar to the University examinations.
3. Internal assessment marks for theory and practical will be converted to out of 40 (theory) + 40 (practical). Internal assessment marks, after conversion, should be submitted to university within the stipulated time as per directives from the University. **Conversion Formula for calculation of marks in internal assessment examinations.**

Phase II	Theory	Practical
IA 1	**50**	**50**
IA 2	**50**	**50**
Prelim	**200**	**100**
Total	**300**	**200**
Conversion out of	**40**	**40**
Conversion formula	**Total marks in 3 IA theory examinations /7.5**	**Total marks in 3 IA Practical examinations /5**
Eligibility criteria after conversion	**16**	**16**
	Combined theory + Practical = 40	

4. While preparing Final Marks of Internal Assessment, the rounding-off marks shall done as illustrated in following table.

Total Internal Assessment Marks	Final rounded marks
33.01 to 33.49	33
33.50 to 33.99	34

5. Students must secure at least 50% marks of the total marks (combined in theory and practical / clinical; not less than 40 % marks in theory and practical separately) assigned for internal assessment in order to be eligible for appearing at the final University examination of that subject.

6. Internal assessment marks will not to be added to marks of the University examinations and will be shown separately in mark list.

7. Remedial measures

A. Remedial measures for non-eligible students

i) At the end of each internal assessment examination, students securing less than 50% marks shall be identified. Such students should be counseled at the earliest and periodically.

ii) Extra classes for such students may be arranged. If majority of the students found to be weak in a particular area then extra classes must be scheduled for all such students. Even after these measures, if a student is failed to secure 50% marks combined in theory and practical (40% separately in theory and practical) after prelim examination, the student shall not be eligible for final examination.

iii) Non eligible candidates are offered to reappear for repeat internal assessment examination/s, which must be conducted 2 months before next University examination. The pattern for this repeat internal assessment examination shall be similar to the final University examination. Only the marks in this examination shall be considered for deciding the eligibility criteria. Following conversion formula shall be used for converting the marks.

	Theory	**Practical**
Remedial examination (pattern as per final examination)	**200**	**100**
Conversion out of	**40**	**40**
Conversion formula	**Marks in remedial theory examinations /5**	**Marks in remedial Practical examinations /2.5**
Eligibility criteria after conversion	**16**	**16**
	Combined theory + Practical = 40	

B. <u>Remedial measures for absent students:</u>

If any of the students is absent for any of the 3 IA examinations due to any reasons, following measures shall be taken.

i. The student is asked to apply to the academic committee of the college for reexamination, through HOD, to ascertain the genuineness of the reason for absentee.

ii. If permitted by academic committee, an additional examination for such students is to be conducted after prelims examination. Marks for such additional examination shall be equal to the missed examination.

iii. Even if a student has missed more than one IA examination, he/she can appear for only one additional IA examination. In such scenario, eligibility should be determined by marks obtained in internal assessment examinations for which the candidate has appeared, without changing the denominator.

Format for Internal Assessment Theory Paper IA – 1 & IA - 2

Question No.	Type of Question	No. of Questions	Max. Marks
1.	MCQ	10	10 (1 marks each)
2.	SAQ	5 (Any four out of 5)	28 (7 marks each)
3.	LAQ	1 (Compulsory)	12
		Total	50

Second MBBS Practical Mark's Structure
Internal Assessment Examinations
(Applicable w.e.f October 2020 onwards examination for batches admitted from June 2019 onwards)

Subject : MICROBIOLOGY Practical										
Seat No.	IA – 1					IA - 2				
	Gram Stain	P.S. for M.P.	Journal/Log book	Viva	Total	Z-N stain	Stool - Routine microscopy	Journal/Log book	Viva	Total
Max. Marks	10	10	10	20	50	10	10	10	20	50

Second MBBS Practical Mark's Structure (Prelim)

Applicable w.e.f October 2020 onwards examination for batches admitted from June 2019 onwards

Subject: MICROBIOLOGY										
Practical							Oral/Viva			Total
Seat No.	Gram/ Z-N staining	P.S. for M.P./ Stool –routine microscopy	Use of PPE/ Hand hygiene	Interpretation of reports	Journal/ Log book	Total	Viva-I	Viva-II	Total	Practical & Oral (F + I)
Max. Marks	15	15	10	20	10	70	15	15	30	100

Second MBBS Practical Mark's Structure (M.U.H.S Examination)

Applicable w.e.f October 2020 onwards examination for batches admitted from June 2019 onwards

Subject: MICROBIOLOGY										
Practical							Oral/Viva			Total
Seat No.	Gram/ Z-N staining	P.S. for M.P./ Stool –routine microscopy	Use of PPE/ Hand hygiene	Interpretation of reports	Journal/ Log book	Total	Viva-I	Viva-II	Total	Practical & Oral (F + I)
	A	B	C	D	E	F	G	H	I	J
Max. Marks	15	15	10	20	10	70	15	15	30	100

MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES, NASHIK

FORMAT / SKELETON OF QUESTION PAPER

SECTION "A" MCQ

Instructions:

1) *Put in the appropriate box below the question number once only.*
2) *Use blue ball point pen only.*
3) *Each question carries **One mark.***
4) *Students will not be allotted mark if he/she overwrites strikes or put white ink on the cross once marked.*

1.20 MCQ(1 marks each) *(20x1)* *20*

a) b) c) d) e) f) g) h) i) j)
k) l) m) n) o) p) r) s) t) u)

SECTION "B"

Instructions:

1) *Use **blue/black** ball point pen only.*
2) ***Do not** write anything on the **blank portion of the question paper**. If written anything, such type of act will be considered as an attempt to resort to unfair means.*
3) ***All** questions are **compulsory**.*
4) *The number to the **right** indicates **full** marks.*
5) *Draw diagrams **wherever** necessary.*
6) *Distribution of syllabus in Question Paper is only meant to cover entire syllabus within the stipulated frame. The Question paper pattern is a mere guideline. Questions can be asked from any paper's syllabus into any question paper. Students cannot claim that the Question is out of syllabus. As It is only for the placement sake, the distribution has been done.*
7) *Use a common answerbook for all sections.*

SECTION "B" (40 Marks)

2. Short Answer Questions (AETCOM 2.5, 2.6, 2.7) (compulsory) (7x1=07)

a)

3. Short Answer Questions (Answer Any 3 out of 4) (7x3=21)

a) b) c) d)

4. Structured Long Answer Questions (Compulsory) (12x1=12)

a)

5. Short Answer Questions (Answer Any 4 out of 5) (7x4=28)

a) b) c) d) e)

6. Structured Long Answer Questions (Compulsory) (12x1=12)

a)

MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES, NASHIK

FORMAT / SKELETON OF QUESTION PAPER

SECTION "A" MCQ

Instructions:

1) *Put in the appropriate box below the question number once only.*
2) *Use blue ball point pen only.*
3) *Each question carries **One mark.***
4) *Students will not be allotted mark if he/she overwrites strikes or put white ink on the cross once marked.*

SECTION "A" MCQ (20 Marks)

1. Multiple Choice Questions (Total 20 MCQ of One mark each) (20 x1 = 20)

a) b) c) d) e) f) g) h) i) j)
k) l) m) n) o) p) r) s) t) u)

SECTION "B"

Instructions:

1) *Use **blue/black** ball point pen only.*
2) ***Do not** write anything on the **blank portion of the question paper**. If written anything, such type of act will be considered as an attempt to resort to unfair means.*
3) ***All** questions are **compulsory**.*
4) *The number to the **right** indicates **full** marks.*
5) *Draw diagrams **wherever** necessary.*
6) *Distribution of syllabus in Question Paper is only meant to cover entire syllabus within the stipulated frame. The Question paper pattern is a mere guideline. Questions can be asked from any paper's syllabus into any question paper. Students cannot claim that the Question is out of syllabus. As It is only for the placement sake, the distribution has been done.*
7) *Use a common answerbook for all sections.*

SECTION "B"

2. Short Answer Questions (Answer Any 4 out of 5) (7x4=28)
   a) b) c) d) e)

3. Structured Long Answer Questions (Compulsory) (12x1=12)
   a)

4. Short Answer Questions (Answer Any 4 out of 5) (7x4=28)
   a) b) c) d) e)

5. Structured Long Answer Questions (Compulsory) .(12x1=12)
   a)

Competency Based Medical Education

Year: Second MBBS

Subject: Microbiology

Learning Resource Material

Books recommended:

1. Textbook of Microbiology – R. Ananthanarayan C. K. Jayaram Panikar
2. A Textbook of Microbiology – P. Chakraborty
3. Textbook of Medical Microbiology – Rajesh Bhatia & Itchpujani
4. Textbook of Medical Microbiology – Arora and Arora
5. Textbook of Medical Parasitology – C. K. Jayaram Panikar
6. Textbook of Medical Parasitology – Arora and Arora
7. Textbook of Medical Parasitology – S.C.Parija
8. Microbiology in clinical practice – D. C. Shanson
9. A Textbook of Parasitology – Dr. R.P. Karyakarte and Dr. A.S. Damle
10. Essentials of Medical Microbiology – Apurba shashtry

Reference books:

1. Mackie McCartney practical Medical Microbiology- Colle JG, Fraser AG
2. Principles of Bacteriology, Virology & Immunology vol. 1, 2, 3, 4, 5- Topley Wilsons
3. Medical Mycology (Emmons)- Kwon – Chung
4. Review of Medical Microbiology (Lange)- Jawetz
5. Immunology- Weir DM
6. Medical Microbiology- David Greenwood, Richard Stack, John Pentherer
7. Parasitology- KD Chatterjee
8. Medical virology- Timbury MC
9. Mackie McCartney Medical, Microbiology vol.1- Duguid JP
10. Microbial infections- Marmion BP, Swain RHA
11. Bailey & Scott's Diagnostic Microbiology
12. Textbook of Mycology – Jagdish Chander

Maharashtra University of Health Sciences
Nashik

MICROBIOLOGY LOGBOOK

For

PHASE II MBBS STUDENTS

AS PER

COMPETENCY BASED CURRICULUM

First Edition: 2020

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Preface

The Medical Council of India has revised the undergraduate medical education curriculum so that the Indian Medical Graduate (IMG) is able to recognize **“Health for all”** as a national goal. He/she should also be able to fulfil his/her societal obligations. The revised curriculum has specified the competencies that a student must attain and clearly defined teaching learning strategies for the same. With this goal in mind, early clinical exposure, integrated teaching, skill development, AETCOM and self-directed learning have been introduced. There would be emphasis on communication skills, basic clinical skills and professionalism. There is a paradigm shift from the traditional didactic classroom-based teaching to learning environments where there is emphasis on learning by exploring, questioning, applying, discussing, analysing, reflecting, collaborating and doing. The recognition of this need is enshrined by a greatly enhanced allocation of time to these methods and also the assessment techniques. With this view in mind the log book has been designed as per the guidelines of competency Based curriculum.

Name of the College

_____

_____

Admission Year : _____

CERTIFICATE

This is to certify that,

Mr/Ms._____

Roll No. _____ has satisfactorily attended/completed all assignments mentioned in this logbook as per the guidelines prescribed by Medical Council of India, for Phase II MBBS Competency Based Curriculum in the subject of Microbiology.

Date: ___/___/_____

Place: _____

Teacher-in-Charge

Professor and Head

Department of Microbiology

Instructions

1) This logbook is prepared as per the guidelines of MCI for implementation of Competency based curriculum for Phase II MBBS students in the subject of Microbiology.
2) Students are instructed to keep their logbook entries up to date.
3) Students are expected to write minimum 1 reflections on Self-Directed Learning (SDL).
4) Students also have to write reflections on AETCOM Modules – 2.5, 2.6 and 2.7.
5) Reflections should be structured using the following guiding questions:

- What happened? (What did you learn from this experience)
- So what? (What are the applications of this learning)
- What next? (What knowledge or skills do you need to develop so that you can handle **this type of situation?)**

6) The logbook assessment will be based on multiple factors like

- Attendance
- Active participation in the sessions,
- Timely completions
- Quality of write up of reflections
- Overall presentation

INDEX

Sr. No	Description	Page No's	Status	Signature of Teacher
			Complete/ Incomplete	
1	Self-Directed Learning, skill assessment, participation in Group discussions			
2	*AETCOM Module No. 2.5, 2.6, 2.7			
3	Attendance Records			
4	Records of Internal Assessment			

*AETCOM – Competencies for IMG, 2018, Medical Council of India.

Section 1. Self-Directed Learning, skill assessment, participation in Group discussions

Sr. No	Self-Directed Learning, skill assessment, participation in Group discussions	Date	Signature of Teacher

Sr. No	Self-Directed Learning, skill assessment, participation in Group discussions	Date	Signature of Teacher

Reflection on Self-directed learning Experience

Topic: **Date:**

Signature of Teacher-in- charge

Reflection on Self-directed learning Experience

Topic: **Date:**

Signature of Teacher-in- charge

Section 2

Reflection on AETCOM Module – 2.5

Topic: **Date:**

Signature of Teacher-in- charge

Reflection on AETCOM Module – 2.6

Topic: **Date:**

Signature of Teacher-in- charge

Reflection on AETCOM Module - 2.7

Topic: **Date:**

Signature of Teacher-in- charge

SECTION 3B: Details of attending extra classes [For poor attendance (if any)]

S. No	Date	Period	Total hours	Signature of Student	Signature of Teacher
Total hours					

Note: Above information is for the benefit of students and parents. In case of any discrepancy departmental record will be treated as final.

Course Content
Second MBBS (from October 2020)
Subject: Pathology (Theory and Practical)

(Based on Medical Council of India, Competency based Undergraduate curriculum for the Indian Medical Graduate, 2018. Vol. 1; page nos.160-203)

1. Total Teaching hours : **230 hours**
2. A. Lectures (hours): **80**
   B. Self-directed learning (hours): **12**
   C. Clinical postings (hours): NIL
   D. Small group teachings/tutorials/Integrated teaching/Practicals (hours)**: 138**

Competency Nos.	Topics & Subtopics	Lectures	Small group teaching	SDL
		80 hours	**138 hours**	**12 hours**
PA1.1 – 1.3	**Introduction to Pathology** *Core*: common definitions and terms, role of pathologist, branches of pathology Practicals: histological techniques, working of a microscope *Non-core*: history and evolution of pathology	1	2	
PA2.1 – 2.8	**Cell injury and adaptations** *Core*: Cell injury, necrosis, apoptosis, intracellular accumulations, cell death, cellular adaptations, calcification, disorders of pigment metabolism, *Non-core*: cellular aging	6	6	
PA3.1-3.2	**Amyloidosis-** *Core*: Pathogenesis and pathology of amyloidosis	1	2	
PA4.1 – 4.4	**Inflammation** *Core*: Acute and chronic inflammation, mediators of inflammation, granulomatous inflammation, including TB	4	4	
PA5.1	**Healing and repair-** *Core*: Repair and wound healing	1	-	
PA6.1- 6.7	**Hemodynamic disorders** *Core*: Edema, hyperemia, congestion, hemorrhage, shock, thrombosis, embolism, ischemia, infarction	4	6	
PA7.1-7.5	**Neoplasia** *Core*: Definition and classification of neoplasia, molecular basis of cancer, carcinogenesis, effects of tumour on host, paraneoplastic syndrome, laboratory diagnosis of cancer *Non-core*: Immunology and immune response to cancer	5	6	
PA8.1-8.3	**Basic diagnostic cytology** *Core*: Diagnostic role of cytology, exfoliative cytology	-	2	
PA9.1-9.37	**Immunopathology** *Core*: Principles of immunity, hypersensitivity reactions, HLA system, transplant rejection, autoimmunity, systemic lupus erythematosus, pathology of HIV/AIDS	5	2	
PA10.1-10.4	**Infections and infestations-** *Core*: Malaria, cysticercus, leprosy, *Non-core:* Common bacterial, viral, protozoal, and helminthic diseases	-	2	1

Competency Nos.	Topics & Subtopics	Lectures	Small group teaching	SDL
		80 hours	138 hours	12 hours
PA11.1-11.3	**Genetic and pediatric diseases-** *Non-core*: Mutations, Tumors and tumour-like conditions of infancy and childhood, common storage disorders	1	-	1
PA12.1-12.3	**Environmental and nutritional disease** *Core*: Air pollution, tobacco, alcohol, protein calorie malnutrition, starvation, obesity	-	2	
PA13.1-13.5	**Introduction to hematology** *Core*: Hematopoiesis and extramedullary hematopoiesis, definition and classification of anemia, anticoagulants, investigations in anemia, peripheral smear examination	2	8	
PA14.1-14.3	**Microcytic anemia-** *Core*: Iron metabolism, microcytic hypochromic anemia, peripheral smear in microcytic anemia	1	4	
PA15.1-15.4	**Macrocytic anemia** *Core*: Vitamin B12 metabolism. Etiology and pathogenesis of B12 deficiency, laboratory investigations in macrocytic anemia, megaloblastic anemia *Non-core:* differences between megaloblastic and non-megaloblastic anemia	1	4	
PA16.1-16.7	**Hemolytic anemia** *Core:* Definition and classification of hemolytic anemia, pathogenesis, features, hematological indices, sickle cell anemia, thalassemia, peripheral smear picture in hemolytic anemia, classification, clinical features of hemolytic anemia	2	6	
PA17.1-17.2	**Aplastic anemia-** *Non-core*: Etiology, pathogenesis, findings, bone marrow aspiration and biopsy	1	2	
PA18.1-18.2	**Leukocyte disorders** *Core:* Leukocytosis, leukopenia, acute and chronic leukemia	2	2	
PA19.1-19.7	**Lymph node and spleen** *Core:* Lymphadenopathy, TB lymphadenitis, Hodgkin's disease, non-Hodgkin's lymphoma, splenomegaly	2	2	
PA20.1	**Plasma cell disorders-** *Core:* Multiple myeloma	-	2	
PA21.1-21.5	**Hemorrhagic disorders** *Core:* Normal hemostasis, vascular and platelet disorders, ITP, hemophilia, clotting disorders, DIC, Vitamin K deficiency	3	4	
PA22.1-22.7	**Blood banking and transfusion** *Core:* Blood group systems, compatibility testing, blood components, transfusion transmitted infections, transfusion reactions, autologous transfusion	2	4	1
PA23.1-23.3	**Clinical Pathology** *Core*: Urine analysis, Body fluids, semen analysis, thyroid function tests, renal function tests, liver function tests		12	
PA24.1-24.7	**Gastrointestinal tract:-** *Core*: Etiology, pathogenesis, pathology, morphology and clinical features of: oral cancer,	5	4	

Competency Nos.	Topics & Subtopics	Lectures	Small group teaching	SDL
		80 hours	138 hours	12 hours
	peptic ulcer disease, polyp, carcinoma stomach, tubercular intestine, inflammatory bowel disease, carcinoma colon			
PA25.1-25.6	**Hepatobiliary system:** *Core*: Bilirubin metabolism, etiopathogenesis and classification of jaundice, hepatic failure, pathology, complications, consequences and laboratory diagnosis of viral hepatitis; pathophysiology of alcoholic liver disease and cirrhosis; portal hypertension; hepatocellular carcinoma Interpretation of liver function tests; Serology panel in viral hepatitis (small group)	5	6	
PA26.1-26.7	**Respiratory system:** *Core*: Etiopathogenesis, morphology, and complications of: pneumonia, lung abscess, chronic obstructive airway disease, bronchiectasis, tuberculosis, occupational lung disease, lung tumours, *Non-core*: pleural tumours, mesothelioma	4	4	
PA27.1-27.10	**Cardiovascular system:** *Core*: Arteriosclerosis, aneurysm, heart failure, ischemic heart disease, laboratory diagnosis of acute coronary syndrome, rheumatic fever and heart disease, infective endocarditis, pericarditis, pericardial effusion, *Non-core*: cardiomyopathies,	5	6	1
PA28.1-28.16	**Urinary tract** *Core*: Histology of kidney, clinical syndromes, acute renal failure, chronic renal failure, acute glomerulonephritis, glomerular manifestations in systemic disease, diseases of tubular interstitium, acute tubular necrosis, acute and chronic pyelonephritis, reflux nephropathy, vascular diseases of kidney, cystic diseases of kidney, urinary calculi and obstructive uropathy, renal tumours *Non-core*: thrombotic angiopathies, urothelial tumours	6	4	2
PA29.1-29.5	**Male genital tract:** *Core*: Testicular tumours, carcinoma penis, benign prostatic hyperplasia, carcinoma prostate, *Non-core*: prostatitis	1	2	
PA30.1-30.9	**Female genital tract:** *Core*: Pathogenesis, etiology, pathology, diagnosis, and progression of: carcinoma cervix, carcinoma endometrium, leiomyoma, leiomyosarcoma, ovarian tumours, gestational trophoblastic neoplasms, *Non-core*: cervicitis, endometriosis, adenomyosis, endometrial hyperplasia	1	6	2
PA31.1-31.4	**Breast-** *Core*: Benign breast disease, carcinoma breast, *Non-core*: gynecomastia	1	2	
PA32.1-32.9	**Endocrine system** *Core*: etiology, pathogenesis, pathology and iodine dependency of: goiters, thyrotoxicosis, hyperthyroidism,	4	4	2

Competency Nos.	Topics & Subtopics	Lectures	Small group teaching	SDL
		80 hours	**138 hours**	**12 hours**
	hypothyroidism; epidemiology, etiopathogenesis, pathology, laboratory diagnosis, complications of diabetes mellitus *Non-core*: hyperparathyroidism, pancreatic cancer, adrenal insufficiency, Cushing syndrome, adrenal neoplasms			
PA33.1-33.5	**Bone and soft tissue** *Core:* Osteomyelitis, bone tumours, soft tissue tumors *Non-core*: Rheumatoid arthritis, Paget's disease of bone	1	4	1
PA34.1-34.4	**Skin** *Core*: Squamous cell carcinoma, basal cell carcinoma *Non-core*: Nevus, melanoma,	1	4	
PA35.1-35.3	**Central nervous system** *Core:* CSF findings in meningitis, CNS tumours	2	4	
PA36.1	**Eye-** *Non-core*: Retinoblastoma			1
AETCOM 2.4	**Working in a health care team**		2	
AETCOM 2.8	**What does it mean to be family member of a sick patient?**		2	

Subject: Pathology

LIST OF PRACTICALS

GENERAL PATHOLOGY

1. Histological techniques, tissue processing, microscopy
2. Intracellular accumulations, calcification
3. Cellular adaptations
4. Disorders of pigment metabolism
5. Amyloidosis
6. Acute inflammation
7. Chronic inflammation and repair
8. Tuberculosis and leprosy
9. Hemodynamic disturbances
10. Neoplasia
11. Infections and infestations

HEMATOLOGY

1. Collection of specimens, anticoagulants, normal hematopoiesis
2. Hemoglobin estimation: Interpretation of report
3. Hematocrit and Erythrocyte sedimentation rate: Interpretation of report
4. Complete blood count: Interpretation of report (without flags) from automated cell counter
5. Preparation of peripheral smear and performing differential leukocyte count, interpretation of peripheral smear
6. Investigations of anemia
7. Investigations of leukemia
8. Plasma cell dyscrasias
9. Investigation of bleeding and clotting disorders
10. Blood banking: Performing blood grouping and interpretation of results

SYSTEMIC PATHOLOGY

1. Lymphoma
2. Splenomegaly
3. Gastrointestinal tract: Ulcers
4. Intestinal polyp and carcinoma intestine
5. Cirrhosis and hepatocellular carcinoma
6. Pneumonia, bronchiectasis
7. Pulmonary tuberculosis and bronchogenic carcinoma
8. Atherosclerosis
9. Left ventricular hypertrophy, myocardial infarction, lab diagnosis of MI
10. Rheumatic heart disease and infective endocarditis
11. Chronic contracted kidney, glomerulonephritis, pyelonephritis
12. Urinary calculi, Renal cell carcinoma,
13. Male genital tract
14. Female genital tract: Carcinoma cervix, Carcinoma endometrium
15. Leiomyoma, Ovarian tumours
16. Gestational trophoblastic disease
17. Breast
18. Thyroid
19. Bone and soft tissue tumours
20. Skin
21. CNS tumours

CLINICAL PATHOLOGY

1. Urine analysis: Interpretation of physical, chemical and microscopic examination results
2. Semen analysis: Lecture demonstration, interpretation of report
3. Basic cytological techniques: FNAC and exfoliative cytology (Lecture demonstration)
4. CSF examination: Lecture demonstration and interpretation of reports
5. Body fluids: Interpretation of serous effusion reports
6. Interpretation of kidney function tests
7. Investigations in jaundice
8. Investigations in diabetes mellitus

AUTOPSY

Indications and technique, autopsy findings in common conditions like myocardial infarction, cirrhosis, portal hypertension, bronchogenic carcinoma, miliary tuberculosis, renal cell carcinoma etc.

Suggested LIST OF SPECIMENS

1. Fatty liver
2. Vesicular mole (hydropic change)
3. Cardiac hypertrophy
4. Kidney- atrophy
5. Large white kidney-amyloidosis
6. Anthracosis
7. Hemochromatosis- Prussian blue reaction
8. Acute appendicitis
9. Serofibrinous pericarditis
10. Abscess- lung/ liver
11. Tubercular lymph node- caseation, matted lymph nodes
12. CVC Liver
13. Splenic infarct
14. Renal infarct
15. Myocardial infarction
16. Leiomyoma
17. Squamous papilloma
18. Hemangioma- Liver
19. Intestinal polyp
20. Squamous cell carcinoma-skin/cervix/penis
21. Adenocarcinoma- intestine
22. Melanoma
23. Enlarged lymph node: Hodgkin's disease
24. Benign ulcer-Peptic ulcer
25. Tubercular intestine
26. Amebic ulcer
27. Malignant ulcer- Carcinoma stomach
28. Cirrhosis
29. Hepatocellular carcinoma
30. Pulmonary tuberculosis
31. Miliary tuberculosis
32. Rheumatic heart disease mitral stenosis
33. Small contracted kidney
34. Renal cell carcinoma
35. Hydronephrosis
36. Urinary calculi
37. Wilm's tumour

38. Carcinoma penis
39. Seminoma
40. Carcinoma cervix
41. Carcinoma endometrium
42. Dermoid cyst
43. Ovarian cystadenoma
44. Leiomyoma
45. Carcinoma breast
46. Goitre
47. Solitary thyroid nodule
48. Giant cell tumour
49. Fibroadenoma of breast
50. Lipoma
51. Metastatic (Liver/Lung)
52. Fat necrosis
53. Meningioma

LIST OF SLIDES

1. Cloudy swelling-kidney
2. Fatty liver
3. Hyaline change in leiomyoma
4. Benign prostatic hyperplasia
5. Squamous metaplasia
6. Calcification
7. Amyloidosis- kidney
8. Nevus
9. Anthracosis
10. Acute appendicitis
11. Acute pyogenic meningitis
12. Tubercular lymphadenitis (Caseous necrosis, granuloma)
13. Tuberculoid leprosy
14. Lepromatous leprosy
15. Pulmonary edema
16. CVC lung
17. CVC liver
18. Thrombus
19. Renal infarct
20. Myocardial infarction
21. Capillary hemangioma
22. Squamous papilloma
23. Squamous cell carcinoma
24. Adenocarcinoma
25. Actinomycosis
26. Rhinosporidiosis
27. Cysticercosis
28. PS-Malaria
29. Eosinophilia
30. Neutrophilia
31. Microcytic anemia
32. Macrocytic anemia
33. Sickle cell anemia
34. Acute leukemia

35. Chronic myeloid leukemia
36. Hodgkin's disease
37. Peptic ulcer
38. Tubercular intestine
39. Adenocarcinoma intestine
40. Cirrhosis
41. Lobar pneumonia
42. Bronchopneumonia
43. Pulmonary tuberculosis
44. Atherosclerosis
45. Myocardial infarction
46. Crescentic glomerulonephritis
47. Chronic pyelonephritis
48. Renal cell carcinoma
49. Benign prostatic hyperplasia
50. Seminoma
51. Fibroadenoma
52. Carcinoma breast
53. Colloid goiter
54. Papillary carcinoma thyroid
55. Basal cell carcinoma
56. Melanoma
57. Lipoma
58. Osteogenic sarcoma
59. Giant cell tumour

CASE-BASED LEARNING

1. Microcytic anemia
2. Macrocytic anemia
3. Hemolytic anemia
4. Multiple myeloma
5. Hepatitis
6. Obstructive jaundice
7. Hemolytic jaundice
8. Nephrotic syndrome
9. Meningitis

CHARTS

1. Interpretation of microcytic anemia
2. Interpretation of macrocytic anemia
3. Interpretation of hemolytic anemia
4. Interpretation of acute leukemia
5. Interpretation of chronic leukemia
6. Interpretation of multiple myeloma
7. Interpretation of bleeding disorder
8. Interpretation of clotting disorder
9. Interpretation of Liver disorders
10. Interpretation of Renal disorders
11. Interpretation of Thyroid disorders
12. Interpretation of acute myocardial infarction
13. Pyogenic meningitis
14. Tubercular meningitis
15. Viral meningitis
16. Diabetes mellitus

Paper wise distribution of topics for Prelim & MUHS Annual Examination
Year: Second MBBS
Subject: Pathology

Paper	Section	Topics
I	A	**Topics of the paper I**
		General Pathology: 1. Cell injury and adaptation 2. Amyloidosis 3. Inflammation and repair 4. Tuberculosis and leprosy 5. Hemodynamic disturbances 6. Immunopathology 7. Neoplasia 8. Infections and infestations 9. Basic diagnostic cytology 10. Histological techniques, tissue processing 11. Genetic and pediatric diseases 12. Environmental and nutritional diseases
		Hematology 1. Introduction to hematology 2. Microcytic anemia 3. Macrocytic anemia 4. Hemolytic anemia 5. Aplastic anemia 6. Leukocyte disorder 7. Lymph node and spleen 8. Plasma cell disorders 9. Hemorrhagic disorders 10. Blood banking and transfusion medicine
		AETCOM 2.4 and 2.8
II	A	**Topics of the paper II**
		Systemic Pathology 1. Gastrointestinal tract 2. Hepatobiliary system 3. Respiratory system 4. Cardiovascular system 5. Urinary tract 6. Male genital tract 7. Female genital tract 8. Breast 9. Endocrine system 10. Bone and soft tissue 11. Skin 12. Central nervous system
		Clinical Pathology 1. Urine analysis 2. Body fluid analysis 3. CSF analysis 4. Liver function test 5. Renal function test 6. Diabetes mellitus 7. Thyroid function test

Second MBBS
Internal Assessment
Subject: Pathology
Applicable w.e.f October 2020 onwards examination for batches admitted from June 2019 onwards

Phase	IA – 1 -Exam (After 3 months , Jan)			IA – 2 -Exam (After 7 months, May)			Prelims (July)		
	Theory	Practical (Including 10 Marks for Journal & Log Book)	Total Marks	Theory	Practical Including 10 Marks for Journal & Log Book	Total Marks	Theory	Practical	Total Marks
Second MBBS	100	50	150	100	50	150	Paper 1 -100 Paper 2 -100	100	300

Assessment in CBME is ONGOING PRCESS,

No Preparatory leave is permitted.

1. There shall be 3 internal assessment examinations in Pathology.
2. The suggested patterns of question paper for first two internal assessment theory examinations can be similar to any of the two papers for final examination. Pattern of the prelims examinations should be similar to the University examinations.
3. Internal assessment marks for theory and practical will be converted to out of 40 (theory) + 40 (practical). Internal assessment marks, after conversion, should be submitted to university within the stipulated time as per directives from the University. **Conversion Formula for calculation of marks in internal assessment examinations.**

Phase II	Theory	Practical
IA 1	**100**	**50**
IA 2	**100**	**50**
Prelim	**200**	**100**
Total	**400**	**200**
Conversion out of	**40**	**40**
Conversion formula	**Total marks in 3 IA theory examinations /10**	**Total marks in 3 IA Practical examinations /5**
Eligibility criteria after conversion	**16**	**16**
	Combined theory + Practical = 40	

4. While preparing Final Marks of Internal Assessment, the rounding-off marks shall done as illustrated in following table.

Total Internal Assessment Marks	Final rounded marks
33.01 to 33.49	33
33.50 to 33.99	34

5. Students must secure at least 50% marks of the total marks (combined in theory and practical / clinical; not less than 40 % marks in theory and practical separately) assigned for internal assessment in order to be eligible for appearing at the final University examination of that subject.
6. Internal assessment marks will not to be added to marks of the University examinations and will be shown separately in mark list.

7. Remedial measures

A. Remedial measures for non-eligible students

i) At the end of each internal assessment examination, students securing less than 50% marks shall be identified. Such students should be counseled at the earliest and periodically.
ii) Extra classes for such students may be arranged. If majority of the students found to be weak in a particular area then extra classes must be scheduled for all such students. Even after these measures, if a student is failed to secure 50% marks combined in theory and practical (40% separately in theory and practical) after prelim examination, the student shall not be eligible for final examination.
iii) Non eligible candidates are offered to reappear for repeat internal assessment examination/s, which must be conducted 2 months before next University examination. The pattern for this repeat internal assessment examination shall be similar to the final University examination. Only the marks in this examination shall be considered for deciding the eligibility criteria. Following conversion formula shall be used for converting the marks.

	Theory	Practical
Remedial examination (pattern as per final examination)	**200**	**100**
Conversion out of	**40**	**40**
Conversion formula	**Marks in remedial theory examinations /5**	**Marks in remedial Practical examinations /2.5**
Eligibility criteria after conversion	**16**	**16**
	Combined theory + Practical = 40	

B. <u>Remedial measures for absent students:</u>

If any of the students is absent for any of the 3 IA examinations due to any reasons, following measures shall be taken.

i. The student is asked to apply to the academic committee of the college for reexamination, through HOD, to ascertain the genuineness of the reason for absentee.

ii. If permitted by academic committee, an additional examination for such students is to be conducted after prelims examination. Marks for such additional examination shall be equal to the missed examination.

iii. Even if a student has missed more than one IA examination, he/she can appear for only one additional IA examination. In such scenario, eligibility should be determined by marks obtained in internal assessment examinations for which the candidate has appeared, without changing the denominator.

Second MBBS Practical Mark's Structure

Applicable w.e.f October 2020 onwards examination for batches admitted from June 2019 onwards

Subject: Pathology (I.A. 1)											
Practical							Oral/Viva				Total
Seat No.											
	OSPE	PS/DLC	CBC report interpretation	Blood group	Histopathology slide	Total	Gross specimen General Pathology	Hematology		Log book	Practical & Oral
Max. Marks	10	5	5	5	5	30	7	8	15	5	50

Subject: Pathology (I.A. 2)									
Practical					Oral/Viva				Total
Seat No.									Practical & Oral
	OSPE	Urine report interpretation	Histopathology slide	Total	Gross specimen Systemic Pathology	Clinical pathology	Total	Log book	Total
Max. Marks	20	5	5	30	7	8	15	5	50

Subject: Pathology Prelim Examination

	Practical								Oral/Viva			
Seat No.											Total	Practical & Oral
	OSPE	PS/DLC	Urine interpretation	CBC report interpretation	Blood group	Histopathology slide	Logbook	Total	Gross specimens	Clinical and hematology	Total	Total (G +)
Max. Marks	32	10	10	5	5	8	10	80	10	10	20	100

Subject: Pathology M.U.H.S. Final Exam.

	Practical							Oral/Viva			
Seat No.							Total			Total	Practical & Oral
	OSPE	PS/DLC	Urine interpretation	CBC report interpretation	Blood group	Histopathology slide		Gross specimens	Clinical and hematology	Total	Total (G + J)
	A	B	C	D	E	F	G	H	I	J	K
Max. Marks	32	10	10	5	5	8	70	15	15	30	100

For Urine examination

Students are not expected to perform urine examination, but to interpret results. Clinical cases with urinary findings may be given to them for interpretation.

Suggested OSPE stations

1. Clinical chart interpretation (Clinical Pathology) - 5 marks
2. Clinical chart interpretation (Clinical Pathology) - 5 marks
3. Clinical chart interpretation (CSF) - 5 marks
4. Clinical chart interpretation (Hematology)- 5 marks
5. Slides (3)- Hematology, benign, inflammatory- 6 marks
6. Specimens (3)- 6 marks

Subject: Pathology

LIST OF PRACTICALS

GENERAL PATHOLOGY

1. Histological techniques, tissue processing, microscopy
2. Intracellular accumulations, calcification
3. Cellular adaptations
4. Disorders of pigment metabolism
5. Amyloidosis
6. Acute inflammation
7. Chronic inflammation and repair
8. Tuberculosis and leprosy
9. Hemodynamic disturbances
10. Neoplasia
11. Infections and infestations

HEMATOLOGY

1. Collection of specimens, anticoagulants, normal hematopoiesis
2. Hemoglobin estimation: Interpretation of report
3. Hematocrit and Erythrocyte sedimentation rate: Interpretation of report
4. Complete blood count: Interpretation of report (without flags) from automated cell counter
5. Preparation of peripheral smear and performing differential leukocyte count, interpretation of peripheral smear
6. Investigations of anemia
7. Investigations of leukemia
8. Plasma cell dyscrasia
9. Investigation of bleeding and clotting disorders
10. Blood banking: Performing blood grouping and interpretation of results

SYSTEMIC PATHOLOGY

1. Lymphoma
2. Splenomegaly
3. Gastrointestinal tract: Ulcers
4. Intestinal polyp and carcinoma intestine
5. Cirrhosis and hepatocellular carcinoma
6. Pneumonia, bronchiectasis
7. Pulmonary tuberculosis and bronchogenic carcinoma
8. Atherosclerosis
9. Left ventricular hypertrophy, myocardial infarction, lab diagnosis of MI
10. Rheumatic heart disease and infective endocarditis
11. Chronic contracted kidney, glomerulonephritis, pyelonephritis
12. Urinary calculi, Renal cell carcinoma,
13. Male genital tract
14. Female genital tract: Carcinoma cervix, Carcinoma endometrium
15. Leiomyoma, Ovarian tumours
16. Gestational trophoblastic disease
17. Breast
18. Thyroid
19. Bone and soft tissue tumours
20. Skin
21. CNS tumours

CLINICAL PATHOLOGY

1. Urine analysis: Interpretation of physical, chemical and microscopic examination results
2. Semen analysis: Lecture demonstration, interpretation of report
3. Basic cytological techniques: FNAC and exfoliative cytology (Lecture demonstration)
4. CSF examination: Lecture demonstration and interpretation of reports
5. Body fluids: Interpretation of serous effusion reports
6. Interpretation of kidney function tests
7. Investigations in jaundice
8. Investigations in diabetes mellitus

AUTOPSY

Indications and techniques, autopsy findings in common conditions like myocardial infarction, cirrhosis, portal hypertension, bronchogenic carcinoma, miliary tuberculosis, renal cell carcinoma etc.

LIST OF SPECIMENS

1. Fatty liver
2. Vesicular mole (hydropic change)
3. Cardiac hypertrophy
4. Kidney- atrophy
5. Large white kidney-amyloidosis
6. Anthracosis
7. Hemochromatosis- Prussian blue reaction
8. Acute appendicitis
9. Serofibrinous pericarditis
10. Abscess- lung/ liver
11. Tubercular lymph node- caseation, matted lymph nodes
12. CVC Liver
13. Splenic infarct
14. Renal infarct
15. Myocardial infarction
16. Leiomyoma
17. Squamous papilloma
18. Hemangioma- Liver
19. Intestinal polyp
20. Squamous cell carcinoma-skin/cervix/penis
21. Adenocarcinoma- intestine
22. Melanoma
23. Enlarged lymph node: Hodgkin’s disease
24. Benign ulcer-Peptic ulcer
25. Tubercular intestine
26. Amebic ulcer
27. Malignant ulcer- Carcinoma stomach
28. Cirrhosis
29. Hepatocellular carcinoma
30. Pulmonary tuberculosis
31. Miliary tuberculosis
32. Bronchectasis
33. Bronchogenic carcinoma
34. Atherosclerosis
35. Myocardial infarction

36. Small contracted kidney
37. Renal cell carcinoma
38. Hydronephrosis
39. Urinary calculi
40. Wilm's tumour
41. Carcinoma penis
42. Seminoma
43. Carcinoma cervix
44. Carcinoma endometrium
45. Dermoid cyst
46. Ovarian cystadenoma
47. Leiomyoma
48. Carcinoma breast
49. Goitre
50. Solitary thyroid nodule
51. Giant cell tumour
52. Fibroadenoma of breast
53. Lipoma
54. Metastasis of Liver/Lung
55. Fat necrosis
56. Meningioma

LIST OF SLIDES

1. Cloudy swelling-kidney
2. Fatty liver
3. Hyaline change in leiomyoma
4. Benign prostatic hyperplasia
5. Squamous metaplasia
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8. Nevus
9. Anthracosis
10. Acute appendicitis
11. Acute pyogenic meningitis
12. Tubercular lymphadenitis (Caseous necrosis, granuloma)
13. Tuberculoid leprosy
14. Lepromatous leprosy
15. Pulmonary edema
16. CVC lung /Liver
17. Thrombus
18. Renal infarct
19. Myocardial infarction
20. Capillary hemangioma
21. Squamous papilloma
22. Squamous cell carcinoma
23. Adenocarcinoma
24. Actinomycosis
25. Rhinosporidiosis
26. Cysticercosis
27. PS-Malaria

28. Eosinophilia
29. Neutrophilia
30. Microcytic anemia
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33. Acute leukemia
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38. Adenocarcinoma intestine
39. Cirrhosis
40. Lobar pneumonia
41. Bronchopneumonia
42. Pulmonary tuberculosis
43. Atherosclerosis
44. Myocardial infarction
45. Crescentic glomerulonephritis
46. Chronic pyelonephritis
47. Renal cell carcinoma
48. Benign prostatic hyperplasia
49. Seminoma
50. Fibroadenoma
51. Carcinoma breast
52. Colloid goiter
53. Papillary carcinoma thyroid
54. Basal cell carcinoma
55. Melanoma
56. Lipoma
57. Osteogenic sarcoma
58. Giant cell tumour

CASE-BASED LEARNING

1. Microcytic anemia
2. Macrocytic anemia
3. Hemolytic anemia
4. Multiple myeloma
5. Hepatitis
6. Obstructive jaundice
7. Hemolytic jaundice
8. Nephrotic syndrome
9. Meningitis

CHARTS

1. Interpretation of microcytic anemia
2. Interpretation of macrocytic anemia
3. Interpretation of hemolytic anemia
4. Interpretation of acute leukemia
5. Interpretation of chronic leukemia

6. Interpretation of multiple myeloma
7. Interpretation of bleeding disorder
8. Interpretation of clotting disorder
9. Interpretation of Liver disorders
10. Interpretation of Renal disorders
11. Interpretation of Thyroid disorders
12. Interpretation of acute myocardial infarction
13. Pyogenic meningitis
14. Tubercular meningitis
15. Viral meningitis
16. Diabetes mellitus

f. Books recommended:

a) Text book of Pathology by Robbins
b) Text book of General Pathology Part I & II by Bhende and Deodhare c) Clinical Pathology by Talib
d) Text book of Pathology by Harsh Mohan e) Text book of Pathology by Muir
f) Haematology De Gruchi
g) IAPM text book of Pathology

Reference books:

a) Anderson's text book of Pathology Vol I & II
b) Oxford text book of Pathology Vol. I, II & III
c) Pathology by Rubin and Farber
d) Pathologic basis of Disease Robbins

MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES, NASHIK

FORMAT / SKELETON OF QUESTION PAPER

1. Course and Year	:	**Second MBBS** *(applicable w.e.f. September 2021 & onwards examinations)*				2. Subject Code	:
3. Subject (PSP)	:	**PATHOLOGY**					
(TT)	:						
4. Paper :	:	**I**	5. Total Marks : **100**	6. Total Time : 3 Hrs.		7. Remu. (Rs)	: Rs. 300/-
						8. Remu. (Rs)	: Rs. 350/-
9. Web Pattern	: [ ]	10. Web Skeleton	: [ ]	11. Web Syllabus	: [ ]	12. Web Old QP	: [ ]

Instructions:

SECTION "A" MCQ

1) *Put in the appropriate box below the question number once only.*
2) *Use blue ball point pen only.*
3) *Each question carries **One mark.***
4) *Students will not be allotted mark if he/she overwrites strikes or put white ink on the cross once marked.*

SECTION "A" MCQ (20 Marks)

1. Multiple Choice Questions (Total 20 MCQ of One mark each. At least 5 should be scenario-based MCQ) (20 x1=20)

a)	b)	c)	d)	e)	f)	g)	h)	i)	j)
k)	l)	m)	n)	o)	p)	q)	r)	s)	t)

Instructions:

1) *Use **blue/black** ball point pen only.*
2) ***Do not** write anything on the **blank portion of the question paper**. If written anything, such type of act will be considered as an attempt to resort to unfair means.*
3) ***All** questions are **compulsory**.*
4) *The number to the **right** indicates **full** marks.*
5) *Draw diagrams **wherever** necessary.*
6) *Distribution of syllabus in Question Paper is only meant to cover entire syllabus within the stipulated frame. The Question paper pattern is a mere guideline. Questions can be asked from any paper's syllabus into any question paper. Students cannot claim that the Question is out of syllabus. As It is only for the placement sake, the distribution has been done.*
7) *Use a common answerbook for all sections.*

2. SAQ - AETCOM Module (2.4 and 2.8) (7x1=7)

a)

3. Short Answer Questions (Any 3 out of 4) (7x3=21)

a) b) c) d)

4. Long Answer Questions (Structured) (12x1=12)

a)

5 Short answer questions (Any 4 out of 5) (7x4=28)

a) b) c) d) e)

6 Long Answer Questions (Structured) (12x1=12)

a)

MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES, NASHIK

FORMAT / SKELETON OF QUESTION PAPER

1. Course and Year	:	**Second MBBS** *(applicable w.e.f. September 2021 & onwards examinations)*				2. Subject Code	:
3. Subject (PSP)	:	**PATHOLOGY**					
(TT)	:						
4. Paper :	:	**II**	5. Total Marks : **100**	6. Total Time : 3 Hrs.		7. Remu. (Rs)	: Rs. 300/-
						8. Remu. (Rs)	: Rs. 350/-
9. Web Pattern	: [ ]	10. Web Skeleton	: [ ]	11. Web Syllabus	: [ ]	12. Web Old QP	: [ ]

Instructions:

SECTION "A" MCQ

1) *Put in the appropriate box below the question number once only.*
2) *Use blue ball point pen only.*
3) *Each question carries **One mark.***
4) *Students will not be allotted mark if he/she overwrites strikes or put white ink on the cross once marked.*

SECTION "A" MCQ (20 Marks)

1. Multiple Choice Questions (Total 20 MCQ of One mark each. At least 5 should be scenario-based MCQ) (20 x1=20)

a)	b)	c)	d)	e)	f)	g)	h)	i)	j)
k)	l)	m)	n)	o)	p)	q)	r)	s)	t)

SECTION "B" & "C"

Instructions:

1) *Use **blue/black** ball point pen only.*
2) ***Do not** write anything on the **blank portion of the question paper**. If written anything, such type of act will be considered as an attempt to resort to unfair means.*
3) ***All** questions are **compulsory**.*
4) *The number to the **right** indicates **full** marks.*
5) *Draw diagrams **wherever** necessary.*
6) *Distribution of syllabus in Question Paper is only meant to cover entire syllabus within the stipulated frame. The Question paper pattern is a mere guideline. Questions can be asked from any paper's syllabus into any question paper. Students cannot claim that the Question is out of syllabus. As It is only for the placement sake, the distribution has been done.*
7) *Use a common answerbook for all sections.*

2. Short Answer Questions (Any 4 out of 5) (7x4=28)

a) b) c) d) e)

3. Long Answer Question Structured (12x1=12)

a)

4 Short answer question (Any 4out of 5) (7x4=28)

b) b) c) d) e)

(12x1=12)

5 Long Answer Questions (Scenario Based)

a)

Competency Based Medical Education

Year: Second MBBS

Subject: *Pathology Learning Resource Material*

Books recommended:

a)Text book of Pathology by Robbins
b)Text book of General Pathology Part I & II by Bhende and Deodhare
c)Clinical Pathology by Talib
d)Text book of Pathology by Harsh Mohan
e)Text book of Pathology by Muir
f)Haematology De Gruchi
g)IAPM text book of Pathology

Reference books:

a)Anderson's text book of Pathology Vol I & II
b)Oxford text book of Pathology Vol. I, II & III
c)Pathology by Rubin and Farber
d)Pathologic basis of Disease Robbins

PATHOLOGY LOGBOOK FOR PHASE SECOND MBBS STUDENTS AS PER COMPETENCY BASED CURRICULUM

Preface

The Medical Council of India has revised the undergraduate medical education curriculum so that the Indian Medical Graduate (IMG) is able to recognize **"Health for all"** as a national goal. He/she should also be able to fulfil his/her societal obligations. The revised curriculum has specified the competencies that a student must attain and clearly defined teaching-learning strategies for the same. With this goal in mind, integrated teaching, skill development, AETCOM and self-directed learning have been introduced. There would be emphasis on communication skills, basic clinical skills and professionalism. There is a paradigm shift from the traditional didactic classroom-based teaching to learning environments where there is emphasis on learning by exploring, questioning, applying, discussing, analysing, reflecting, collaborating and doing. The recognition of this need is enshrined by a greatly enhanced allocation of time to these methods and also the assessment techniques. With this view in mind the log book has been designed as per the guidelines of competency based curriculum.

Name of the College

_____

Admission Year: _____

CERTIFICATE

This is to certify that,

Mr/Ms._____

Roll No. _____ has satisfactorily attended/completed all assignments mentioned in this logbook as per the guidelines prescribed by Medical Council of India, for Phase II MBBS Competency Based Curriculum in the subject of Pathology.

Date: ___/___/_____

Place: _____

Teacher Incharge

Professor and Head
Department of Pathology

Instructions

1. This logbook is prepared as per the guidelines of MCI for implementation of Competency based curriculum for Phase II MBBS students in the subject of Pathology.
2. Students are instructed to keep their logbook entries up to date.
3. Students also have to write reflections on AETCOM Module 2.4 and 2.8)
   Reflections should be structured using the following guiding questions:
   - What happened? (What did you learn from this experience)
   - So what? (What are the applications of this learning)
   - What next? (What knowledge or skills do you need to develop so that you can handle this type of situation?)
4. The logbook assessment will be based on multiple factors like
   - Attendance
   - Active participation in the sessions
   - Timely completions
   - Quality of write up of reflections
   - Overall presentation

CONTENTS

S.No	Topic	Signature of the teacher	Remarks

S.No	Topic	Signature of the teacher	Remarks

S.No	Topic	Signature of the teacher	Remarks

ASSESSMENT OF LOG BOOK

Sr.No	Description	Maximum Marks	Marks obtained	Signature of Teacher
1	**Completion of Journal- I term**	5		
2	**Completion of Journal- II term**	5		
3	**Performance in case based learning**	3		
4	**Participation in seminars, research projects, quiz etc**	3		
5	**Reflections on AETCOM Module** *** 2.4 , 2.8**	2		
6	**Attendance Records**	2		
7	**Total marks obtained for log book**	20		

* AETCOM – Competencies for IMG, 2018, Medical Council of India.

The following skills have been performed by the student and are certified by the teacher as follows:

		Date	Teacher's signature
1.	Preparation of peripheral smear		
2.	Interpretation of liver function tests and viral serology panel		
3	Interpretation of CSF in meningitis		

PRACTICAL TOPICS IN PATHOLOGY

Students are expected to write briefly about the topics and draw labelled diagrams of relevant slides in their journal, and get it assessed from their teacher.

GENERAL PATHOLOGY

1. Histological techniques, tissue processing, microscopy
2. Intracellular accumulations, calcification
3. Cellular adaptations
4. Disorders of pigment metabolism
5. Amyloidosis
6. Acute inflammation
7. Chronic inflammation and repair
8. Tuberculosis and leprosy
9. Hemodynamic disturbances
10. Neoplasia
11. Infections and infestations

HEMATOLOGY

1. Collection of specimens, anticoagulants, normal hematopoiesis
2. Hemoglobin estimation: Interpretation of report
3. Hematocrit and Erythrocyte sedimentation rate: Interpretation of report
4. Complete blood count: Interpretation of report (without flags) from automated cell counter
5. Preparation of peripheral smear and performing differential leukocyte count, interpretation of peripheral smear
6. Investigation of anemia
7. Investigation of leukemia
8. Plasma cell dyscrasia
9. Investigation of bleeding and clotting disorders
10. Blood banking: Performing blood grouping and interpretation of results

SYSTEMIC PATHOLOGY

1. Lymphoma
2. Splenomegaly
3. Gastrointestinal tract: Ulcers
4. Intestinal polyp and carcinoma intestine
5. Cirrhosis and hepatocellular carcinoma
6. Pneumonia, bronchiectasis
7. Pulmonary tuberculosis and bronchogenic carcinoma
8. Atherosclerosis
9. Left ventricular hypertrophy, myocardial infarction, lab diagnosis of MI
10. Rheumatic heart disease and infective endocarditis
11. Chronic contracted kidney, glomerulonephritis, pyelonephritis
12. Urinary calculi, Renal cell carcinoma,
13. Male genital tract
14. Female genital tract: Carcinoma cervix, Carcinoma endometrium
15. Leiomyoma, Ovarian tumours
16. Gestational trophoblastic disease
17. Breast
18. Thyroid

19. Bone and soft tissue tumours
20. Skin
21. CNS tumours

CLINICAL PATHOLOGY

1. Urine analysis: Interpretation of physical, chemical and microscopic examination results
2. Semen analysis: Lecture demonstration, interpretation of report
3. Basic cytological techniques: FNAC and exfoliative cytology (Lecture demonstration)
4. CSF examination: Lecture demonstration and interpretation of reports
5. Body fluids: Interpretation of serous effusion reports
6. Interpretation of kidney function tests
7. Investigations in jaundice
8. Investigations in diabetes mellitus

AUTOPSY

Indications and techniques, autopsy findings in common conditions like myocardial infarction, cirrhosis, portal hypertension, bronchogenic carcinoma, miliary tuberculosis, renal cell carcinoma etc.

Reflection on AETCOM 2.4

Topic: Working in a health care team **Date:**

Signature of Teacher-in- charge

Reflection on AETCOM 2.8

Topic: What does it mean to be a family member of a sick patient? Date:

Signature of Teacher-in- charge

Participation in Seminars, Research Projects, Quiz

S.No	Activity	Date	Signature of Teacher

Signature of Teacher-in- charge

Details of attending extra classes [For poor attendance (if any)]

S.No	Date	Period	Total hrs	Signature of student	Signature of Teacher
Total hours					

Note: Above information is for the benefit of students and parents. In case of any discrepancy departmental record will be treated as final.

Course Content

Second MBBS (from October 2020) Subject:

PHARMACOLOGY Theory / Practical

Based on Medical Council of India, Competency based Undergraduate curriculum for the Indian Medical Graduate, 2018. (Vol. 1; page nos. 136-159)

1. Total Teaching hours : **230**
2. A. Lectures(hours):**80** B. Self directed learning (hours) :- **12**
   C. Clinical Postings (Hours): NA
   D. Small group teachings/tutorials/Integrated teaching/Practicals (hours)**: 138**

Competency Nos.	Topics & Subtopics
PH1.1	Introduction to Pharmacology
PH1.2	
PH1.3	
PH1.9	
PH1.11	Routes of drug administration
PH1.4	Pharmacokinetics – Absorption, Distribution, Metabolism, Excretion
PH1.5	Pharmacodynamics
PH1.6	Adverse drug reactions –Types, mechanisms and precautions
PH1.7	
PH1.52	Principles of management of Poisoning
PH1.8	Drug interactions- Mechanisms and clinical relevance
PH1.59	Essential medicines, Fixed dose combinations Over the counter drugs Herbal medicines
PH1.60	Pharmacogenomics, Pharmacoeconomics
PH1.63	Drug Regulations
PH1.64	Drug development, Good Clinical Practice

Competency Nos.	Topics & Subtopics
PH1.10	Prescription writing
PH1.12	Factors modifying drug dose- Dose calculation

PH1.13	Pharmacology of Adrenergic drugs, Pharmacology of Anti adrenergic drugs
PH1.14	Pharmacology of Cholinergic drugs, Pharmacology of Anticholinergic drugs
PH1.15	Pharmacology of Skeletal muscle relaxants
PH1.16	Pharmacology of Histamine and antihistaminics, Pharmacology of Serotonin and drugs acting on serotonergic pathways, Pharmacotherapy of MigrainePharmacology of NSAIDSPharmacotherapy of Gout and Rheumatoid arthritis
PH1.17	Pharmacology of Local anaesthetics
PH1.18	Pharmacology of General anaesthetics and Preanesthetic drugs
PH1.19	Pharmacology of Sedatives & hypnotics Pharmacology of Antiepileptics Pharmacology of Anti depressants and anti anxiety drugs Pharmacology of Antipsychotics and anti manic drugs Pharmacology of Drugs used for neurodegenerative disorders Pharmacology of Opioids
PH1.20	Pharmacology of Alcohol and alcohol poisoning
PH1.21	
PH1.22	Pharmacology of drug dependence, drug abuse and Deaddiction
PH1.23	
PH1.24	Pharmacology of Diuretics and antidiuretics
PH1.25	Pharmacology of coagulants and anticoagulants Pharmacology of antiplatelets Pharmacology of thrombolytics and antifibrinolytics Pharmacology of plasma expanders
PH1.26	Pharmacology of Renin Angiotensin-Aldosterone system
PH1.27	Pharmacology of calcium channel blockers Pharmacology of other vasodilators and sympatholytics Pharmacotherapy of Hypertension, Pharmacotherapy of Shock

Competency Nos.	Topics & Subtopics
PH1.28	Pharmacology of Antianginal drugs Pharmacotherapy of IHD Pharmacology of Drugs for PVD
PH1.29	Pharmacology of Drugs used in CCF
PH1.30	Pharmacology of Antiarrhythmics
PH1.31	Pharmacology of Drugs for dyslipidemia
PH1.32	Pharmacology of Drugs for bronchial asthma and COPD
PH1.33	Pharmacology of Drugs for cough
PH1.34	Pharmacology of Drugs for acid peptic diseases Pharmacology of Antiemetics and prokinetics Pharmacology of Drugs for diarrhea and constipation
PH1.35	Pharmacotherapy of anemias
PH1.36	Pharmacology of Antidiabetic drugs Pharmacology of Drugs for thyroid dysfunction Pharmacology of Drugs affecting calcium metabolism
PH1.37	Pharmacology of Estrogen and antiestrogens Pharmacology of Progestins and antiprogestins Pharmacology of Androgens and antiandrogens Pharmacology of Anterior Pituitary hormones and their antagonists
PH1.38	Pharmacology of Corticosteroids and antagonists
PH1.39	Pharmacology of Hormonal contraceptives
PH1.40	Pharmacotherapy of infertility and erectile dysfunction
PH1.41	Pharmacology of Oxytocics and tocolytics
PH1.42	Introduction to Chemotherapy-General principles, Pharmacology of Sulfonamides and Timethoprim Pharmacology of Fluoroquinolones, Pharmacology of Penicillin and its derivatives Pharmacology of Cephalosporins, Pharmacology of other Beta lactam antibiotics Pharmacology of Aminoglycosides, Pharmacology of Macrolides Pharmacology of Broad spectrum antibiotics, Pharmacology of newer antibacterials
PH1.43	

Competency Nos.	Topics & Subtopics
PH1.44	Pharmacology of Antitubercular drugs including MDR and XDR TB
PH1.45	
PH1.46	Pharmacology of Antileprotics

PH1.47	Pharmacology of Antimalarials Pharmacology of Antiamoebic and other Antiprotozoal drugs Pharmacology of Anthelminthics
PH1.48	Pharmacotherapy of UTI Pharmacotherapy of STD Pharmacology of Antiretroviral drugs
PH1.49	Pharmacology of Anticancer drugs
PH1.50	Pharmacology of Immunomodulators
PH1.51	Occupational and environmental toxicology
PH1.53	Pharmacology of Chelating agents
PH1.54	Vaccines and Antisera
PH1.55	National health programs
PH1.56	Geriatric and Pediatric pharmacology
PH1.57	Drugs used in skin disorders
PH1.58	Drugs used in Ocular disorders
PH1.61	Dietary supplements and Nutraceuticals
PH1.62	Antiseptics and Disinfectants
Competency Nos.	**Topics & Subtopics**
	CLINICAL PHARMACY
PH2.1	Drug dosage forms (Oral, local, parenteral)
PH2.2	ORS preparation
PH2.3	Intravenous drip setting
PH2.4	Dosage calculation
	CLINICAL PHARMACOLOGY

Competency Nos.	Topics & Subtopics
	CLINICAL PHARMACY
PH3.1	Prescription writing and communication
PH3.8	
PH5.1	
PH3.2	Critical appraisal of Prescription
PH3.3	Evaluation of Promotional Drug literature
PH3.4	Adverse drug reaction-Identification and reporting
PH3.5	Introduction to the concept of P – drugs and preparation of P-drug list
PH3.6	Interaction with a pharmaceutic representative and critical evaluation of Drug information
PH3.7	Introduction to the concept of Essential medicines
	EXPERIMENTAL PHARMACOLOGY
PH4.1	Drug administration on Maniquins
PH4.2	Study of effects of drugs on blood pressure using software
	COMMUNICATION TOPICS
PH5.2	Importance of optimal use of drug therapy, storage of medicines
PH5.3	Importance of Drug Compliance
PH5.4	
PH5.5	Problems associated with prescribing drugs with dependence liability
PH5.6	Problems associated with use of OTC drugs
PH5.7	Prescription: legal and ethical aspects
2.1	AETCOM-1
2.2	AETCOM-2
2.3	AETCOM-3

Paper wise distribution of topics for Prelim & MUHS Annual Examination

Year: Second MBBS Subject: **Pharmacology**

Paper	Section	Topics
I	**A**	**MCQs on all topics of the paper I**
	B	General Pharmacology
		Autonomic Nervous system including skeletal muscle relaxants
		Cardiovascular system
		Haematology
		Gastro intestinal drugs
		Respiratory system
		AETCOM- 2.1, 2.2, 2.3 (section B one SAQ)
II	**A**	**MCQs on all topics of the paper II**
	B	Central Nervous system including general/local anaesthesia
		Endocrine system
		Chemotherapy system
		Autacoids
		MISC. TOPICS : Chelating agents, Vaccines and Antisera, ocular pharmacology, dermatological pharmacology, nutraceuticals, occupational and environmental pharmacology, toxicology)

Second MBBS Internal Assessment
Subject: Pharmacology
Applicable w.e.f October 2020 onwards examination for batches admitted from June 2019 onwards

Phase	IA-1 - Exam (Jan)			IA – 2 -Exam (May)			Prelim (July)		
	Theory	Practical (Including 10 Marks for Journal & Log Book)	Total Marks	Theory	Practical Including 10 Marks for Journal & Log Book	Total Marks	Theory	Practical	Total Marks
Second MBBS	100	100	200	100	100	200	Paper 1 -100 Paper 2 -100	100	300

Assessment in CBME is ONGOING PRCESS,

No Preparatory leave is permitted.

1. There shall be 3 internal assessment examinations in Pharmacology.
2. The suggested patterns of question paper for first two internal assessment theory examinations can be similar to any of the two papers for final examination. Pattern of the prelims examinations should be similar to the University examinations.
3. Internal assessment marks for theory and practical will be converted to out of 40 (theory) + 40 (practical). Internal assessment marks, after conversion, should be submitted to university within the stipulated time as per directives from the University. **Conversion Formula for calculation of marks in internal assessment examinations.**

Phase	Theory	Practical
IA 1	**100**	**100**
IA 2	**100**	**100**
Prelim	**200**	**100**
Total	**400**	**300**
Conversion out of	**40**	**40**
Conversion formula	**Total marks in 3 IA theory examinations /10**	**Total marks in 3 IA Practical examinations /7.5**
Eligibility criteria after conversion	**16**	**16**
	Combined theory + Practical = 40	

4. While preparing Final Marks of Internal Assessment, the rounding-off marks shall done as illustrated in following table.

Total Internal Assessment Marks	Final rounded marks
33.01 to 33.49	33
33.50 to 33.99	34

5. Students must secure at least 50% marks of the total marks (combined in theory and practical / clinical; not less than 40 % marks in theory and practical separately) assigned for internal assessment in order to be eligible for appearing at the final University examination of that subject.

6. Internal assessment marks will not to be added to marks of the University examinations and will be shown separately in mark list.

7. **Remedial measures**

A. Remedial measures for non-eligible students

i) At the end of each internal assessment examination, students securing less than 50% marks shall be identified. Such students should be counseled at the earliest and periodically.
ii) Extra classes for such students may be arranged. If majority of the students found to be weak in a particular area then extra classes must be scheduled for all such students. Even after these measures, if a student is failed to secure 50% marks combined in theory and practical (40% separately in theory and practical) after prelim examination, the student shall not be eligible for final examination.
iii) Non eligible candidates are offered to reappear for repeat internal assessment examination/s, which must be conducted 2 months before next University examination. The pattern for this repeat internal assessment examination shall be similar to the final University examination. Only the marks in this examination shall be considered for deciding the eligibility criteria. Following conversion formula shall be used for converting the marks.

	Theory	Practical
Remedial examination (pattern as per final examination)	**200**	**100**
Conversion out of	**40**	**40**
Conversion formula	**Marks in remedial theory examinations /5**	**Marks in remedial Practical examinations /2.5**
Eligibility criteria after conversion	**16**	**16**
	Combined theory + Practical = 40	

B. <u>Remedial measures for absent students:</u>

If any of the students is absent for any of the 3 IA examinations due to any reasons, following measures shall be taken.

i. The student is asked to apply to the academic committee of the college for reexamination, through HOD, to ascertain the genuineness of the reason for absentee.

ii. If permitted by academic committee, an additional examination for such students is to be conducted after prelims examination. Marks for such additional examination shall be equal to the missed examination.

iii. Even if a student has missed more than one IA examination, he/she can appear for only one additional IA examination. In such scenario, eligibility should be determined by marks obtained in internal assessment examinations for which the candidate has appeared, without changing the denominator.

Practical marks Distribution:

A. For I st and II nd IA examinations

1. **Journal / Logbook** - 10 Marks
2. **Viva** – **20** marks
3. **Clinical Pharmacy (20 marks)** –
    a. Dosage form- 10 marks,
    b. ORS preparation/ IV drip setting- 5 marks
    c. Dose calculation – 5 marks
4. **Clinical Pharmacology** (30 marks)-
    a. Prescription writing- 10 marks
    b. Prescription criticism and rewriting / justification of FDC – 10 marks
    c. ADR identification / ADR reporting- 5 marks
    d. P- drug list- 5 marks.
5. **Experimental Pharmacology** (**10 marks**) **OSPE** –
    a. Drug administration using maniquin / drug effect using CAL software (or any other)- 10 marks
6. **Communication (10 marks) OSPE-**
    a. prescription communication **/** ethics- legal drug storage/ use of device/drug adherence-compliance/ drug dependence/OTC/ interaction with Medical representative- 10 marks

B. For Preliminary examinations

1. **Viva** – **30** marks
    a. Viva I- 15 marks
    b. Viva II- 15 marks
2. **Clinical Pharmacy (20 marks)** –
    a. Dosage form- 10 marks,
    b. ORS preparation/ IV drip setting- 5 marks
    c. Dose calculation – 5 marks
3. **Clinical Pharmacology (30 marks)-**
    a. Prescription writing- 10 marks
    b. Prescription criticism and rewriting / justification of FDC – 10 marks
    c. ADR identification / ADR reporting- 5 marks
    d. P- drug list- 5 marks.
4. **Experimental Pharmacology** (**10 marks**) **OSPE** –
    a. Drug administration using maniquin / drug effect using CAL software (or any other)- 10 marks
5. **Communication (10 marks) OSPE-**
    a. prescription communication **/** ethics- legal drug storage/ use of device/drug adherence-compliance/ drug dependence/OTC/ interaction with Medical representative- 10 marks

Second MBBS Practical Mark's Structure (I, II & Prelim Exam.)

Applicable w.e.f October 2020 onwards examination for batches admitted from June 2019 onwards

Subject: PHARMACOLOGY								
Practical						VIVA	Log Book/ Journal	Practical & Oral
Seat No.	Clinical Pharmacy	Clinical Pharmacology	Experimental Pharmacology	Communication	Total			
Max. Marks	20	30	10	10	**70**	20	**10**	100

Second MBBS Practical Mark's Structure

(M.U.H.S. Final Exam.)

Applicable w.e.f October 2020 onwards examination for batches admitted from June 2019 onwards

Subject: PHARMACOLOGY									
Practical						**Oral/Viva**			**Total**
Seat No.	**Clinical Pharmacy**	**Clinical Pharmacology**	**Experimental Pharmacology**	**Communication**	**Total**	**VIVA 1**	**VIVA 2**	**Total**	**Practical & Oral (E + H)**
	A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**
Max. Marks	20	30	10	10	**70**	15	15	**30**	100

MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES, NASHIK
FORMAT / SKELETON OF QUESTION PAPER

1. Course and Year	: **Second MBBS** *(applicable w.e.f. September 2021& onwards examinations)*					2. Subject Code	:
3. Subject (PSP)	: **Pharmacology**						
(TT)	:						
4. Paper :	: **I**	5. Total Marks	: **100**	6. Total Time	: **3** Hrs.	7. Remu. (Rs)	: Rs. 300/-
						8. Remu. (Rs)	: Rs. 350/-
9. Web Pattern	: [ ]	10. Web Skeleton	: [ ]	11. Web Syllabus	: [ ]	12. Web Old QP	: [ ]

SECTION "A" MCQ

Instructions:

1) *Put in the appropriate box below the question number once only.*
2) *Use blue ball point pen only.*
3) *Each question carries **One mark.***
4) *Students will not be allotted mark if he/she overwrites strikes or put white ink on the cross once marked.*

SECTION "A" MCQ (20 Marks)

1. Multiple Choice Questions (Total 20 MCQ of One mark each) (20 x1 = 20)

a)	b)	c)	d)	e)	f)	g)	h)	i)	j)
k)	l)	m)	n)	o)	p)	q)	r)	s)	t)

SECTION "B"

Instructions:

1) *Use **blue/black** ball point pen only.*
2) ***Do not** write anything on the **blank portion of the question paper**. If written anything, such type of act will be considered as an attempt to resort to unfair means.*
3) ***All** questions are **compulsory**.*
4) *The number to the **right** indicates **full** marks.*
5) *Draw diagrams **wherever** necessary.*
6) *Distribution of syllabus in Question Paper is only meant to cover entire syllabus within the stipulated frame. The Question paper pattern is a mere guideline. Questions can be asked from any paper's syllabus into any question paper. Students cannot claim that the Question is out of syllabus. As It is only for the placement sake, the distribution has been done.*
7) *Use a common answerbook for all sections.*

SECTION "B"

2. Short Answer Questions (AETCOM(2.1, 2.2, 2.3)(compulsory) (7x1=07)

   a)

3. Short Answer Questions (Answer Any 3 out of 4) (7x3=21)

   a) b) c) d)

4. Structured Long Answer Questions (Compulsory) (12x1=12)

   a)

5. Short Answer Questions (Answer Any 4 out of 5) (7x4=28)

   a) b) c) d) e)

6. Structured Long Answer Questions (Compulsory) (12x1=12)

   a)

MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES, NASHIK
FORMAT / SKELETON OF QUESTION PAPER

1.	Course and Year	:	**Second MBBS** *(applicable w.e.f. September 2021& onwards examinations)*						2. Subject Code	:	
3.	Subject (PSP)	:	**Pharmacology**								
	(TT)	:									
4.	Paper :	:	**II**	5. Total Marks	: **100**	6. Total Time	: **3** Hrs.		7. Remu. (Rs)	:	Rs. 300/-
									8. Remu. (Rs)	:	Rs. 350/-
9.	Web Pattern	: [ ]		10. Web Skeleton	: [ ]	11. Web Syllabus	: [ ]		12. Web Old QP	:	[ ]

Instructions:

SECTION "A" MCQ

1) *Put in the appropriate box below the question number once only.*
2) *Use blue ball point pen only.*
3) *Each question carries **One mark.***
4) *Students will not be allotted mark if he/she overwrites strikes or put white ink on the cross once marked.*

SECTION "A" MCQ (20 Marks)

1. Multiple Choice Questions (Total 20 MCQ of One mark each) (20 x1 = 20)

a)	b)	c)	d)	e)	f)	g)	h)	i)	j)
k)	l)	m)	n)	o)	p)	q)	r)	s)	t)

SECTION "B"

Instructions:

1) *Use **blue/black** ball point pen only.*
2) ***Do not** write anything on the **blank portion of the question paper**. If written anything, such type of act will be considered as an attempt to resort to unfair means.*
3) ***All** questions are **compulsory**.*
4) *The number to the **right** indicates **full** marks.*
5) *Draw diagrams **wherever** necessary.*
6) *Distribution of syllabus in Question Paper is only meant to cover entire syllabus within the stipulated frame. The Question paper pattern is a mere guideline. Questions can be asked from any paper's syllabus into any question paper. Students cannot claim that the Question is out of syllabus. As It is only for the placement sake, the distribution has been done.*
7) *Use a common answerbook for all sections.*

SECTION "B"

2. Short Answer Questions(Answer Any 4 out of5) (7x4=28)

   a) b) c) d) e)

3. Structured Long Answer Questions (**Compulsory**) (12x1=12)

   a)

4. Short Answer Questions (Answer Any 4 out of 5) (7x4=28)

   a) b) c) d) e)

5. Structured Long Answer Questions (**Compulsory**) (12x1=12)

   a)

Competency Based Medical Education

Year: Second MBBS

Subject: *Pharmacology Learning Resource Material*

***Books recommended* :**

1. Basic & Clinical Pharmacology. Katzung BG (Ed), Publisher: Prentice Hall International Ltd., London.
2. Pharmacology & Pharmacotherapeutics. Satoskar RS, Bhandarkar SD (Ed), Publisher: Popular Prakashan, Bombay.
3. Essentials of Medical Pharmacology. Tripathi KD (Ed), Jaypee Brothers, publisher:Medical Publishers (P) Ltd.
4. Clinical Pharmacology. Laurence DR, Bennet PN, Brown MJ (Ed). Publisher: Churchill Livingstone

***Reference books* :**

1. Goodman & G̀ilman s The Pharmacological Basis of Therapeutics. Hardman JG & Limbird LE (Ed), Publisher: McGraw-Hill, New York.
2. A Textbook of Clinical Pharmacology. Roger HJ, Spector RG, Trounce JR (Ed), Publisher: Hodder and Stoughton Publishers.

Maharashtra University of Health Sciences
Nashik

PHARMACOLOGY LOGBOOK For PHASE SECOND MBBS STUDENTS AS PER COMPETENCY BASED CURRICULUM

Preface

The Medical Council of India has revised the undergraduate medical education curriculum so that the Indian Medical Graduate (IMG) is able to recognize **"Health for all"** as a national goal. He/she should also be able to fulfil his/her societal obligations. The revised curriculum has specified the competencies that a student must attain and clearly defined teaching learning strategies for the same. With this goal in mind, integrated teaching, skill development, AETCOM and self-directed learning have been introduced. There would be emphasis on communication skills, basic clinical skills and professionalism. There is a paradigm shift from the traditional didactic classroom-based teaching to learning environments where there is emphasis on learning by exploring, questioning, applying, discussing, analysing, reflecting, collaborating and doing. The recognition of this need is enshrined by a greatly enhanced allocation of time to these methods and also the assessment techniques. With this view in mind the log book has been designed as per the guidelines of competency Based curriculum.

Name of the College

_____

_____

_____

Admission Year : _____

CERTIFICATE

This is to certify that,

Mr/Ms._____

Roll No. _____ has satisfactorily attended/completed all assignments mentioned in this logbook as per the guidelines prescribed by Medical Council of India, for Phase I MBBS Competency Based Curriculum in the subject of Pharmacology.

Date: ___/___/_____

Place: _____

Teacher Incharge

Professor and Head
Department of Pharmacology

Instructions

1) This logbook is prepared as per the guidelines of MCI for implementation of Competency based curriculum for Phase II MBBS students in the subject of Pharmacology.

2) Students are instructed to keep their logbook entries up to date.

3) Students are expected to write minimum 2 reflections on any two activities each of Clinical Pharmacology skills & Self-Directed Learning (SDL).

4) Students also have to write reflections on AETCOM Module 2.1 , 2.2, 2.3) Reflections should be structured using the following guiding questions:

- What happened? (What did you learn from this experience)
- So what? (What are the applications of this learning)
- What next? (What knowledge or skills do you need to develop so that you can handle this type of situation?)

5) The logbook assessment will be based on multiple factors like

- Attendance
- Active participation in the sessions
- Timely completions
- Quality of write up of reflections
- Overall presentation

INDEX

Sr. No	Description	Page No's	Status Complete/ Incomplete	Signature of Teacher
1	Clinical Pharmacology Skills			
2	Self-Directed Learning, Seminars, Projects, Quizzes			
3	AETCOM Module * 2.1 , 2.2, 2.3			
4	Attendance Records			
5	Records of Internal Assessment			

* AETCOM – Competencies for IMG, 2018, Medical Council of India.

Record of Clinical Pharmacology Skills

S.No	Skill	Setting	Correlation	Date	Signature of Teacher
1	Critical appraisal of prescription / audit				
2	Critical evaluation of promotional literature				
3	Filling and interpretation of ADR report				
4	Prepare and explain P drug list				
5	Optimised Interaction with pharmaceutical representative				
6	Prepare essential drug list for health care facility				

Reflection on Clinical Pharmacology Skills

Topic: **Date:**

Signature of Teacher-in- charge

Reflection on Clinical Pharmacology Skills

Topic: **Date:**

Signature of Teacher-in- charge

Reflection on Clinical Pharmacology Skills

Topic: **Date:**

Signature of Teacher-in- charge

2. Self Directed Learning, Seminars, Tutorials, Projects, Quizzes

S.No	Self Directed Learning, Seminars, Tutorials, Projects, Quizzes	Date	Signature of Teacher

Reflection on self directed learning activities

Topic: **Date:**

Signature of Teacher-in- charge

Reflection on self directed learning activities

Topic: **Date:**

Signature of Teacher-in- charge

Reflection on self directed learning activities

Topic: **Date:**

Signature of Teacher-in- charge

3: AETCOM Module

2.1 Foundation of communication 2

2.2 Foundation of bioethics

2.3 Health care as a right

Reflection on AETCOM module

Topic: **Date:**

Signature of Teacher-in- charge

Reflection on AETCOM module

Topic: **Date:**

Signature of Teacher-in- charge

Reflection on AETCOM module

Topic: **Date:**

Signature of Teacher-in- charge

SECTION 4B: Details of attending extra classes [For poor attendance (if any)]

S.No	Date	Period	Total hrs	Signature of student	Signature of Teacher
Total hours					

Note: Above information is for the benefit of students and parents. In case of any discrepancy departmental record will be treated as final.

Dentistry

For theory Competencies included in Surgery Syllabus

Clinical Postings-3 days

Day	Competency no.	Topic	Hours
1	DE1.3, DE1.5, DE2.3, DE2.5, DE3.3, DE3.4	Identify dental caries, malocclusion, complete compliment of teeth and identify missing teeth, counsel the patients with respect to correction of malocclusion and the role it might have on oral health specifically on the TMJ, counsel the patients with respect to oral hygiene, diet and the direct bearing on systemic health and vice versa, Counsel the patients on the importance of restoring missing teeth with respect to benefits on oral and systemic hygiene.	3 hrs
2	DE4.3, DE4.4	Identify potential precancerous/cancerous lesions, Counsel patients about oral cancers with respect to tobacco smoking, alcohol and other causative factors.	3 hrs
3	DE5.3, DE5.4, DE5.5	Identify periodontal disease, discuss the role of periodontal disease as a focus of sepsis, counsel the patients with respect to oral hygiene, diet and the direct bearing on systemic health and vice versa	3 hrs

INTERNAL ASSESSMENT EXAM IN DENTISTRY

Please refer General Surgery Syllabus (available on https://www.muhs.ac.in/upload/syllabus/Third%20MBBS%20General%20Surgery%20Syllabus%20030621.pdf) for details internal assessment in dentistry.

Format / Skeleton of question paper for University

Please refer General Surgery Syllabus (available on https://www.muhs.ac.in/upload/syllabus/Third%20MBBS%20General%20Surgery%20Syllabus%20030621.pdf) for details question paper for university in dentistry.

ORTHOPAEDICS

Subject: Orthopedics

Lectures

MBBS phase III- part I

Total Teaching hours: 15 hours

Competencies written in red is of alignment and integration

S. NO	TOPICS	COMPETENCIES	SUBTOPICS	AIT	HOURS
1.	**Skeletal Trauma, Poly trauma**				
		OR1.1	**Lecture**: 1		1
			Principles of pre-hospital care and Casualty management of a trauma victim including principles of triage		
		OR1.2	**Lecture** : 2		1
		SU2.1	The aetiopathogenesis, clinical features, investigations, and principles of management of shock Describe Pathophysiology of shock, types of shock & principles of resuscitation including fluid replacement and monitoring.	General Surgery	
		OR1.3	**Lecture**: 3		1

			Aetiopathogenesis, clinical features, investigations, and principles of management of soft tissue injuries		
		OR1.4	**Lecture**: 4		1
			Describe and discuss the Principles of management of soft tissue injuries		
		OR1.5	**Lecture**: 5		1
		AN10.12	Describe and discuss the aetiopathogenesis, clinical features, investigations, and principles of management of dislocation of major joints, shoulder, knee, hip Describe and demonstrate shoulder, hip, knee joint for– type, articular surfaces, capsule, synovial membrane, ligaments, relations, movements, muscles involved, blood supply, nerve supply and applied anatomy	Human Anatomy	
4.	**Fractures**				
		OR2.1	**Lecture**: 6		1
		AN8.3	Describe and discuss the mechanism of Injury, clinical features, investigations and plan management of fracture of clavicle Enumerate peculiarities of clavicle	Human Anatomy	
		OR2.2	**Lecture**: 7		1
			Describe and discuss the mechanism of Injury, clinical features, investigations and plan management of fractures of proximal		

			humerus		
		OR2.3	**Lecture**: 8		1
			Select, prescribe and communicate appropriate medications for relief of joint pain		
		OR2.4	**Lecture**: 9		1
			Describe and discuss the mechanism of injury, clinical features, investigations and principles of management of fracture of shaft of humerus and intercondylar fracture humerus with emphasis on neurovascular deficit		
		OR2.5	**Lecture**: 10		1
			Describe and discuss the aetiopathogenesis, clinical features, mechanism of injury, investigation & principles of management of fractures of both bones forearm and Galeazzi and Monteggia injury		
		OR2.6	**Lecture**: 11		1
			Describe and discuss the aetiopathogenesis, mechanism of injury, clinical features, investigations and principles of management of fractures of distal radius		
		OR2.7	**Lecture**: 12		1
		AN48.2	Describe and discuss the aetiopathogenesis, mechanism of injury, clinical features, investigations and principles of management of pelvic injuries with emphasis on hemodynamic instability Describe & demonstrate the (position, features, important peritoneal	Human Anatomy	

			and other relations, blood supply, nerve supply, lymphatic drainage and clinical aspects of) important male & female pelvic viscera		
		OR2.8	**Lecture**: 13		1
			Describe and discuss the aetiopathogenesis, mechanism of injury, clinical features, investigations and principles of management of spine injuries with emphasis on mobilisation of the patient		
		OR2.9	**Lecture**: 14		1
			Describe and discuss the mechanism of injury, Clinical features, investigations and principle of management of acetabular fracture		
		OR2.10	**Lecture**: 15		1
			Describe and discuss the aetiopathogenesis, mechanism of injury, clinical features, investigations and principles of management of fractures of proximal femur		

MBBS Phase III- Part II

Total Teaching hours: 20 hours

Competencies written in red is of alignment and integration

S. NO	TOPICS	COMPETENCIES	SUBTOPICS	AIT	HOURS
1.	**Fractures**				
		OR2.11	**Lecture**: 1		**1**
			Describe and discuss the aetiopathogenesis, mechanism of injury,		

			clinical features, investigations and principles of management of (a)Fracture patella (b) Fracture distal femur (c) Fracture proximal tibia with special focus on neurovascular injury and compartment syndrome		
		OR2.12	**Lecture**: 2		**1**
			Describe and discuss the aetiopathogenesis, clinical features, investigations and principles of management of Fracture shaft of femur in all age groups and the recognition and management of fat embolism as a complication		
		OR2.13	**Lecture**: 3		**1**
			Describe and discuss the aetiopathogenesis, clinical features, Investigation and principles of management of: (a) Fracture both bones leg (b) Calcaneus (c) Small bones of foot		
		OR2.14	**Lecture**: 4		**1**
		AN20.1	Describe and discuss the aetiopathogenesis, clinical features, Investigation and principles of management of ankle fractures Describe and demonstrate the type, articular surfaces, capsule, synovial membrane, ligaments, relations, movements and muscles	Human Anatomy	

			involved, blood and nerve supply of tibiofibular and ankle joint		
		OR2.15	**Lecture**: 5		**1**
			Plan and interpret the investigations to diagnose complications of fractures like malunion, non-union, infection, compartmental syndrome		
		OR2.16	**Lecture**: 6		1
			Describe and discuss the mechanism of injury, clinical features, investigations and principles of management of open fractures with focus on secondary infection prevention and management		
2	Musculoskeletal Infection				
		OR3.1	**Lecture**: 7		**1**
		PA33.1	Describe and discuss the aetiopathogenesis, clinical features, investigations and principles of management of Bone and Joint infections a) Acute Osteomyelitis b) Subacute osteomyelitis c) Acute Suppurative arthritis d) Septic arthritis & HIV infection e) Spirochaetal infection f) Skeletal Tuberculosis	Pathology	

			Classify and describe the etiology, pathogenesis, manifestations, radiologic and morphologic features and complications of osteomyelitis		
3	Skeletal Tuberculosis				
		OR4.1	**Lecture**: 8		**1**
			Describe and discuss the clinical features, Investigation and principles of management of Tuberculosis affecting major joints (Hip, Knee) including cold abcess and caries spine		
4	Rheumatoid Arthritis and associated inlammatory disorders				
		OR5.1	**Lecture**: 9		**1**
			Describe and discuss the aetiopathogenesis, clinical features, investigations and principles of management of various inflammatory disorder of joints		
5	Degenerative disorders				
		OR6.1	**Lecture**: 10		**1**
			Describe and discuss the clinical features, investigations and principles of management of degenerative condition of spine (Cervical Spondylosis, Lumbar Spondylosis, PID)		
6	Metabolic bone				

	disorders				
		OR7.1	**Lecture**: 11		**1**
			Describe and discuss the aetiopathogenesis, clinical features, investigation and principles of management of metabolic bone disorders in particular osteoporosis, osteomalacia, rickets, Paget's disease		
7	Poliomyelitis				
		OR8.1	**Lecture**: 12		**1**
			Describe and discuss the aetiopathogenesis, clinical features, assessment and principles of management a patient with Post Polio Residual Paralysis		
8	Cerebral Palsy				
		OR9.1	**Lecture**: 13		**1**
			Describe and discuss the aetiopathogenesis, clinical features, assessment and principles of management of Cerebral palsy patient		
9	Bone Tumors				
		OR10.1	**Lecture**: 14		**1**
		PA33.2	Describe and discuss the aetiopathogenesis, clinical features, investigations and principles of management of benign and malignant bone tumours and pathological fractures Classify and describe the etiology, pathogenesis, manifestations, radiologic and morphologic features and complications and metastases of bone tumors	Pathology	

10	Peripheral nerve injuries				
		OR11.1	**Lecture**: 15		**1**
			Describe and discuss the aetiopathogenesis, clinical features, investigations and principles of management of peripheral nerve injuries in diseases like foot drop, wrist drop, claw hand, palsies of Radial, Ulnar, Median, Lateral Popliteal and Sciatic Nerves		
11	Congenital lesions				
		OR12.1	**Lecture**: 16		**1**
		AN19.6	Describe and discuss the clinical features, investigations and principles of management of Congenital and acquired malformations and deformities of: a. limbs and spine - Scoliosis and spinal bifida b. Congenital dislocation of Hip,Torticollis, c. congenital talipes equino varus Explain the anatomical basis of Flat foot & Club foot	Human Anatomy	
12	**ProceduralSkills**				
		OR13.1	**Lecture**: 17		**1**
			Participate in a team for procedures in patients and demonstrating the ability to perform on mannequins / simulated patients in the following: i. Above elbowplaster ii. Below kneeplaster iii. Above kneeplaster iv. Thomassplint v. splinting for long bonefractures		

			Strapping for shoulder and clavicletrauma		
		OR13.2	**Lecture**: 18		**1**
			Participate as a member in team for Resuscitation of Polytrauma victim by doing all of the following : (a) I.V. access central -peripheral (b) Bladdercatheterization (c) Endotrachealintubation Splintage		
13	**CounsellingSkills**				
		OR14.1	**Lecture**: 19		**1**
			Demonstrate the ability to counsel patients regarding prognosis in patients with various orthopedic illnesses like a. fractures with disabilities b. fractures that require prolonged bed stay c. bone tumours d. congenital disabilities		
		OR14.2	**Lecture**: 20		**1**
			Demonstrate the ability to counsel patients to obtain consentfor various orthopedic procedures like limp amputation, permanent fixationsetc..		

Subject: Orthopaedics

Small Group Discussion

MBBS phase III/I-

Small group teachings/ Tutorials/ Integrated teaching/ Practical's: 20 hours

***These are suggested topics which can be modified at institutional level and SLO (Specific learning objectives) can be designed for each topic at institutional level**

S. NO	TOPICS*	COMPETENCIES	SUBTOPICS	AIT	HOURS
1.	**Skeletal Trauma, Poly trauma**				
		OR1.1	SGD: 1		1
			Describe and discuss the Principles of pre-hospital care and Casualty management of a trauma victim including principles of triage		
		OR1.1	SGD: 2		1
			Describe the Principles of triage in case of trauma victim		
		OR1.2	SGD: 3		1
			Describe and discuss the aetiopathogenesis, clinical features, investigations, and principles of		

			management of shock		
		OR1.3	SGD: 4		1
			Describe and discuss the aetiopathogenesis, clinical features, investigations, and principles of management of soft tissue injuries		
		OR1.4	SGD: 5		1
			Describe and discuss the Principles of management of soft tissue injuries		
		OR1.5	SGD: 6		1
		AN10.12	Describe and discuss the aetiopathogenesis, clinical features, investigations, and principles of management of dislocation of shoulder joint Describe and demonstrate shoulder joint for– type, articular surfaces, capsule, synovial membrane, ligaments, relations, movements, muscles involved, blood supply, nerve supply and applied anatomy	Human Anatomy	
		OR1.5	SGD: 7		1
		AN18.4	Describe and discuss the aetiopathogenesis, clinical features, investigations, and principles of management of dislocation of knee joint Describe and demonstrate the type, articular surfaces, capsule, synovial membrane, ligaments,	Human Anatomy	

			relations, movements and muscles involved, blood and nerve supply, bursae around the knee joint		
		OR1.5	SGD: 8		1
		AN17.1	Describe and discuss the aetiopathogenesis, clinical features, investigations, and principles of management of dislocation of hip joint Describe and demonstrate the type, articular surfaces, capsule, synovial membrane, ligaments, relations, movements and muscles involved, blood and nerve supply, bursae around the hip joint	Human Anatomy	
		OR1.6	SGD: 9		1
			Discuss and demonstrate methods of closed reduction of shoulder dislocation / hip dislocation / knee dislocation		
2.	**Fractures**				
		OR2.1	SGD: 10		1
		AN8.3	Describe and discuss the mechanism of Injury, clinical features, investigations and plan management of fracture of clavicle Enumerate peculiarities of clavicle	Human Anatomy	
		OR2.2	SGD: 11		1

			Describe and discuss the mechanism of Injury, clinical features, investigations and plan management of fractures of proximal humerus		
		OR2.3	SGD: 12		1
			Select, prescribe and communicate appropriate medications for relief of joint pain		
		OR2.4	SGD: 13		1
			Describe and discuss the mechanism of injury, clinical features, investigations and principles of management of fracture of shaft of humerus and intercondylar fracture humerus with emphasis on neurovascular deficit		
		OR2.5	SGD: 14		1
		AN8.1	Describe and discuss the aetiopathogenesis, clinical features, mechanism of injury, investigation & principles of management of fractures of both bones forearm Identify the given bone, its side, important features & keep it in anatomical position	Human Anatomy	
		OR2.5	SGD: 15		1
			Describe and discuss the aetiopathogenesis, clinical features, mechanism of injury, investigation & principles of management of Galeazzi injury		
		OR2.5	SGD: 16		1

			Describe and discuss the aetiopathogenesis, clinical features, mechanism of injury, investigation & principles of management of fractures of Monteggia injury		
		OR2.6	SGD: 17		1
			Describe and discuss the aetiopathogenesis, mechanism of injury, clinical features, investigations and principles of management of fractures of distal radius		
		OR2.7	SGD: 18		1
		AN48.2	Describe and discuss the aetiopathogenesis, mechanism of injury, clinical features, investigations and principles of management of pelvic injuries with emphasis on hemodynamic instability Describe & demonstrate the (position, features, important peritoneal and other relations, blood supply, nerve supply, lymphatic drainage and clinical aspects of) important male & female pelvic viscera	Human Anatomy	
		OR2.8	SGD: 19		1
			Describe and discuss the aetiopathogenesis, mechanism of injury, clinical features, investigations and principles of management of spine injuries with emphasis on mobilisation of the patient		

		OR2.9	SGD: 20		1
			Describe and discuss the mechanism of injury, Clinical features, investigations and principle of management of acetabular fracture		

MBBS Phase III/II-

Small group teachings/ Tutorials/ Integrated teaching/ Practical's: 25 hours

***These are suggested topics which can be modified at institutional level and SLO (Specific learning objectives) can be designed for each topic at institutional level**

SR. NO.	TOPICS	COMPETENCIES	SUBTOPICS	AIT	HOURS
1.	**Fracture**				
		OR2.10	SGD: 1		1
		AN17.2	Describe and discuss the aetiopathogenesis, mechanism of injury, clinical features, investigations and principles of management of fractures of proximal femur Describe anatomical basis of complications of fracture neck of femur	Human Anatomy	

		OR2.11	SGD: 2		1
			Describe and discuss the aetiopathogenesis, mechanism of injury, clinical features, investigations and principles of management of (a) fracture patella (b) Fracture distal femur (c) Fracture proximal tibia		
		OR2.11	SGD: 3		1
			Describe and discuss the aetiopathogenesis, mechanism of injury, clinical features, investigations and principles of management of neurovascular injury and compartment syndrome in fractures around knee		
		OR2.12	SGD: 4		1
			Describe and discuss the aetiopathogenesis, clinical features, investigations and principles of management of Fracture shaft of femur in all age groups and the recognition and management of fat embolism as a complication		
		OR2.13	SGD: 5		1

			Describe and discuss the aetiopathogenesis, clinical features, Investigation and principles of management of: (a) Fracture both bones leg (b) Calcaneus (c) Small bones of foot		
		OR2.14	SGD: 6		1
		AN20.1	Describe and discuss the aetiopathogenesis, clinical features, Investigation and principles of management of ankle fractures Describe and demonstrate the type, articular surfaces, capsule, synovial membrane, ligaments, relations, movements and muscles involved, blood and nerve supply of tibiofibular and ankle joint	Human Anatomy	
		OR2.15	SGD: 7		1
			Plan and interpret the investigations to diagnose complications of fractures like malunion, non-union, infection, compartmental syndrome		

		OR2.16	SGD: 8		1
			Describe and discuss the mechanism of injury, clinical features, investigations and principles of management of open fractures with focus on secondary infection prevention and management		
3.	**MusculoskeletalInfection**				
		OR3.1	SGD: 9		1
			Describe and discuss the aetiopathogenesis, clinical features, investigations and principles of management of Bone and Joint infections a) Acute Osteomyelitis b) Subacute osteomyelitis c) Acute Suppurative arthritis		
		OR3.1	SGD: 10		1
		PA33.1	Describe and discuss the aetiopathogenesis, clinical features, investigations and principles of management of Bone and Joint infections	Pathology	

			a)Septic arthritis & HIV infection b)Spirochaetal infection c)Skeletal Tuberculosis Classify and describe the etiology, pathogenesis, manifestations, radiologic and morphologic features and complications of osteomyelitis		
		OR3.2	SGD: 11		1
			Describe and discuss aspiration of joints		
		OR3.3	SGD: 12		1
			Describe and discuss procedures like drainage of abscess, sequestrectomy/ saucerisation and arthrotomy		
4.	**SkeletalTuberculosis**				
		OR4.1	SGD: 13		1
			Describe and discuss the clinical features, Investigation and principles of management of Tuberculosis affecting major joints (Hip, Knee) including cold abcess		

			and caries spine		
5.	**Rheumatoid Arthritis and associatedinlammatorydisorders**				
		OR5.1	SGD: 14		1
			Describe and discuss the aetiopathogenesis, clinical features, investigations and principles of management of various inflammatory disorder of joints		
6.	**Degenerativedisorders**				
		OR6.1	SGD:15		1
			Describe and discuss the clinical features, investigations and principles of management of degenerative condition of spine (Cervical Spondylosis, Lumbar Spondylosis, PID)		
7.	**Metabolicbonedisorders**				
		OR7.1	SGD:16		1
		PA33.4	Describe and discuss the aetiopathogenesis, clinical features, investigation and principles of management of metabolic bone disorders in particular osteoporosis, osteomalacia, rickets, Paget's disease	Pathology	

			Classify and describe the etiology, pathogenesis, manifestations, radiologic and morphologic features and complications of Paget's disease of the bone		
8.	**Poliomyelitis**				
		OR8.1	SGD:17		1
			Describe and discuss the aetiopathogenesis, clinical features, assessment and principles of management a patient with Post Polio Residual Paralysis		
9.	**CerebralPalsy**				
		OR9.1	SGD:18		1
			Describe and discuss the aetiopathogenesis, clinical features, assessment and principles of management of Cerebral palsy patient		
10.	**BoneTumors**				
		OR10.1	SGD:19		1
		PA33.2	Describe and discuss the aetiopathogenesis, clinical features, investigations and principles of management of benign and malignant bone tumours and pathological fractures	Pathology	

			Classify and describe the etiology, pathogenesis, manifestations, radiologic and morphologic features and complications and metastases of bone tumors		
11.	**Peripheralnerveinjuries**				
		OR11.1	SGD:20		1
			Describe and discuss the aetiopathogenesis, clinical features, investigations and principles of management of peripheral nerve injuries in diseases like foot drop, wrist drop, claw hand, palsies of Radial, Ulnar, Median, Lateral Popliteal and Sciatic Nerves		
12.	**Congenitallesions**				
		OR12.1	SGD: 21		1
			Describe and discuss the clinical features, investigations and principles of management of Congenital and acquired malformations and deformities of: a. limbs and spine - Scoliosis and spinal bifida b. Torticollis		

		OR12.1	SGD: 22		1
			Describe and discuss the clinical features, investigations and principles of management of Congenital and acquired malformations and deformities of: a. Congenital dislocation of Hip b. congenital talipes equino varus		
13.	**ProceduralSkills**				
		OR13.1	SGD: 23		1
			Participate in a team for procedures in patients and demonstrating the ability to perform on mannequins / simulated patients in the following: i. Above elbow plaster ii. Below knee plaster iii. Above knee plaster iv. Thomas splint v. splinting for long bone fractures vi. Strapping for shoulder and clavicle trauma		
		OR13.2	SGD: 24		1
			Participate as a member in team for Resuscitation of Polytrauma victim		

			by doing all of the following : (a)I.V. access central - peripheral (b)Bladder catheterization (c)Endotracheal intubation (d)Splintage		
14	**CounsellingSkills**	OR14.1	SGD: 25		1
			Demonstrate the ability to counsel patients regarding prognosis in patients with various orthopedic illnesses like a.fractures with disabilities b.fractures that require prolonged bed stay c.bonetumours d.congenital disabilities		

Subject: Orthopaedics

Self-Directed Learning

MBBS phase III/I

Total Teaching hours : 5 hours

***These are suggested topics which can be modified at institutional level**

Sr. No.	TOPICS	COMPETENCIES	SUBTOPICS	AIT	HOURS
1.	**Counselling Skills**				
		OR14.3	SDL:1		3
			Demonstrate the ability to convince the patient for referral to a higher centre in various orthopedic illnesses, based on the detection of warning signals and need for sophisticated management		
		OR14.2	SDL:2		2
			Describe the ability to counsel patients to obtain consent for various orthopedic procedures like limp amputation, permanent fixations etc..		

MBBS phase III/II

Total Teaching hours : 5 hours

***These are suggested topics which can be modified at institutional level**

Sr. No	TOPICS	COMPETENCIES	SUBTOPICS	HOURS
1.	**Musculoskeletal Infection**			
		OR3.1	SDL:1	3
			Describe and discuss the aetiopathogenesis, clinical features, investigations and principles of management of Bone and Joint infections a) Acute Osteomyelitis b) Subacute osteomyelitis c) Acute Suppurative arthritis d) Septic arthritis & HIV infection e) Spirochaetal infection f) Skeletal Tuberculosis	
2.	**Metabolic bone disorders**			
		OR7.1	SDL:2	2
			Describe and discuss the aetiopathogenesis, clinical features, investigation and principles of management of metabolic bone disorders in particular osteoporosis, osteomalacia, rickets, Paget's disease	

Internal Assessment Orthopedics

Please refer General Surgery Syllabus (available on https://www.muhs.ac.in/upload/syllabus/Third%20MBBS%20General%20Surgery%20Syllabus%20030621.pdf) for details internal assessment in orthopedics.

Format / Skeleton of question paper for University

Please refer General Surgery Syllabus (available on https://www.muhs.ac.in/upload/syllabus/Third%20MBBS%20General%20Surgery%20Syllabus%20030621.pdf) for details question paper for university in orthopedics.

Name of the Institute

Department of Orthopaedics

Journal

Name of the Student: _____

Roll Number: _____

Batch: _____

Address: _____

Mobile number: _____

Email id: _____

Sayings of the great:

To study the phenomenon of disease without books is to sail an uncharted sea, while to study books without patients is not to go to sea at all.

-Sir William Osler

The good physician treats the disease, the great physician treats the patient who has the disease.

-Sir William Osler

Observe, record, tabulate, and communicate. Use your five senses. Learn to see, learn to hear, learn to feel, learn to smell and know that by practice alone you can become expert.

-Sir William Osler

INDEX

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1.	Clinical Posting Completion Certificate
2.	General Instructions
3.	Posting Certificate
4.	Template of case histories and operative notes
5.	Phase II
6.	Phase III/I
7.	Phase III/II

Clinical Posting Completion Certificate

This is to certify that the candidateMr./Ms. _____ Registration no. _____admitted in the year _____in the _____ _____ Medical College has satisfactorily completed / has not completed all assignments / requirements/ posting mentioned in this journal and journal for final MBBS (II/III-I/III-II) in Orthopaedics during the period from .....to…… She / He is / is not eligible to appear for the summative (University) assessment as on the date given below.

Signature of Head of Department
Date

GENERAL INSTRUCTIONS

1) The journal is a record of the academic / co-curricular activities of the designated student, who would be responsible for maintaining his/her journal.

2) The student is responsible for getting the entries in the journal verified by the Faculty in charge regularly.

3) Entries in the journal will reflect the activities undertaken in the department& have to be scrutinized by the Head of the concerned department.

4) The journal is a record of various activities by the student like:
- Overall participation &performance
- Attendance
- Participation in sessions
- Record of completion of pre-determined activities.
- Acquisition of selected competencies

5) The journal is the record of work done by the candidate in that department / specialty and should be verified by the college before submitting the application of the students for the University examination.

6)*Proposed number of case records should be mentioned in the journal-:

Phase 2- 1st clinical posting (2 weeks) = 2 Orthopaedics cases + 1 Follow-up cases + OT record sheet minimum 3 cases (2 major and 1 minor) + Asepsis, Basic bandaging and dressing skill performed independently and to get it certified

Phase3- 2ndclinicalposting (4 weeks) = 4Orthopaedics cases+ 2follow-up cases + OT record sheet minimum 4 cases (2 major and 2 minor) + Basic splinting and slab application skill performed independently and to get it certified

Phase 4- 3rd Clinical Posting (2 weeks) = 4 Orthopaedics cases + 2 follow-up cases + OT record sheet minimum 4 cases (2 major and 2 minor) + Basic suturing, aseptic joint aspiration skill to be performed independently and to get it certified.

POSTING CERTIFICATE

Name: - Year of Admission: -

Year of appearing for Final M.B.B.S _____

TERM	From	To	Absent days	Case Histories Written	Remark	Signature Of Unit Head
Orthopaedics (II Phase) (2 weeks)						
Orthopaedics (III Phase – Part I) (4 weeks)						
Orthopaedics (III Phase – Part II) (2 weeks)						

N.B: -

1. Students must get the signature of the Unit In charge when posting is completed.
2. This certificate must be submitted before every internal assessment & Preliminary examination.
3. Completed record is mandatory for appearing for the Final Examination.

Template for Clinical Cases and Operative Notes		
Name of Patient	Age/Sex	Ward no.
MRD No	Head of the Unit	
Occupation		
Religion		
Address		
Date of admission		Date of Discharge
Chief complaints		
HOPI/ODP		

Past H/O

Personal

H/O

Family

H/O

Menstrual History in females

Obstetrical History in females

General examination

Built &
Nourishment
Level of
consciousness
Temperature.

Pulse rate
Respiratory
rate Blood
Pressure
Pallor/ cyanosis/clubbing/oedema/Lymphadenopathy/ Icterus

Local examination:

Inspection

Palpation

Movements

Measurements

Systemic Examination:

CV

S

RS

CN

S

PA

Provisional

Diagnosis

Differential

Diagnosis

Investigations

Hematological

Biochemical

Radiological

Xray
-
USG
- CT
-
MRI
-

Final Diagnosis

Treatment-Plan

Pre-operative Workup

Template for Operative Notes

Date: - Time: - Surgeon: -

Indication And operation: The working Diagnosis on which the procedure was based and the name of the operation.

Type of Anesthesia: -

Position of patient: - Describe the position and precautions taken to avoid complications.

Incision: - Name the incision, shape and length including any extensile exposure. A drawing may be useful.

Findings: Describe what was found. List structures identified and protected.

Procedure: Report what was exactly done. Describe prosthetics or special instruments/ implants used.

Closure: Washout, Hemostasis and drains, Method used for closure and Dressing

Post-operative care: Clear instructions with frequency on (a) general observations, (b) Checks on function, (c) Wound care, (d) removal of drains, (e) Start of mobilization, (f) removal of stitches, (g) discharge, (h) follow up.

Complications: List of potential complications and actions to be taken under a 'What If' list

Specimen sent for Histopathology Examination: Yes/No

Histopathology report:

Daily progress note:

Post-Op Progress Report -

(To be filled everyday in serious cases and every third day in other. Mention observations pertaining to a case, any special investigations done and daily treatment administered)

Day (Post-op)	Gen. condition (Appearance, Pulse, BP, Temp Chest)	Fluid intake	Fluid Output			Complications- If any and their treatment and investigation
			Urine	Suction	Others	

Condition of Patient on discharge: -

Advices on discharge: -

Reflection by students in max. 200 words: -
(Write your overall impression of case at the time of discharge or when you leave the case)

Feedback by Faculty –

Signature by Student and Faculty: -

Operative Notes

Date: - Time: -

Surgeon: -

Indication And operation:

Type of Anesthesia: -

Position of patient: -

Incision: -

Findings:

Procedure:

Closure:

Post-operative care

Complications:

Specimen sent for Histopathology Examination: Yes/No

Histopathology report:

Progress Report -

(To be filled everyday in serious cases and every third day in other. Mention observations pertaining to a case, any special investigations done and daily treatment administered)

Day (Post-op)	Gen. condition (Appearance, Pulse, BP, Temp Chest)	Fluid intake	Fluid Output			Complications- If any and their treatment and investigation
			Urine	Suction	Others	

Condition of Patient on discharge: -

Advices on discharge: -

PHASE-II INDEX OF THE CASE HISTORIES OF
ORTHOPAEDICS CASES AND FOLLOW UP CASES
(minimum 2 Orthopaedics cases + 1 Follow-up cases)

Sr. No	Name of The Patient	Date	Diagnosis	Ward no.	Page No.	Signature of Faculty
1.						
2.						
3.						
4.						
5.						
6.						

Case 1:

Case 2:

Case 3:

Case 4:

Case 5:

Case 6:

INDEX OF THE OPERATIVE PROCEDURES
PHASE II
[OT record sheet minimum 3 cases (2 major and 1 minor) +Asepsis, Basic bandaging and dressing skills performed independently.]

Sr. no.	Name of the patient	Date	Diagnosis	Operative Procedures	Page No.	Signature of Faculty
1.						
2.						
3.						
4.						

Case 7:

Case 9:

Case 1:

Case 4:

PHASE-III/I INDEX OF THE CASE HISTORIES OF ORTHOPAEDICS CASES AND FOLLOW UP CASES
(minimum 4 Orthopaedics cases+ 2 follow-up cases)

Sr. No	Name of The Patient	Date	Diagnosis	Ward no.	Page No.	Signature of Faculty
1.						
2.						
3.						
4.						
5.						
6.						
7.						

Case 1:

Case 8:

Case 3:

Case 2:

Case 4:

Case 6:

Case 8:

INDEX OF THE OPERATIVE PROCEDURES
PHASE III/I
[OT record sheet minimum 4 cases (2 major and 4 minor) + Basic splinting and slab application skill performed independently]

Sr. no.	Name of the patient	Date	Diagnosis	Operative Procedures	Page No.	Signature of Faculty
1.						
2.						
3.						
4.						
5.						

Case 1:

Case 3:

Case 5:

Case 7:

Case 9:

PHASE-III/II INDEX OF THE CASE HISTORIES OF ORTHOPAEDICS CASES AND FOLLOW UP CASES

[minimum 4 Orthopaedics cases + 2 follow-up cases]

Sr. No	Name of The Patient	Date	Diagnosis	Ward no.	Page No.	Signature of Faculty
1.						
2.						
3.						
4.						
5.						
6.						
7.						

Case 1:

Case 4:

Case 6:

Case 8:

Case 5:

Case 6:

Case 7:

INDEX OF THE OPERATIVE PROCEDURES

PHASE III/II

[OT record sheet minimum 4 cases (2 major and 2 minor) + Basic suturing, aseptic joint aspiration skill, early management of trauma skills & demonstrates trauma life support]

Sr. no.	Name of the patient	Date	Diagnosis	Operative Procedures	Page No.	Signature of Faculty
1.						
2.						
3.						
4.						
5.						

Case 1:

Case 2:

Case

Case

Case

Name of the Institute

LOG BOOK

DEPARTMENT OF ORTHOPAEDICS

CONTENTS

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1	LOGBOOK CERTIFICATE	03
2	BIODATA OF THE CANDIDATE	04
3	GENERAL INSTRUCTIONS	05
4	RECORD OF INTERNAL ASSESSMENT EXAMINATIONS	07
5	SELF DIRECTED LEARNING / TUTORIALS / SEMINARS / EXTRA CURRICULAR ACTIVITIES	08
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LOGBOOK CERTIFICATE

This is to certify that this logbook is the bonafide record of Mr. / Ms. ..... Roll No.……..Admission Year ……..……., of the Department of Orthopaedics at .....Medical College.

The logbook is as per the guidelines of Competency Based Undergraduate Medical Education Curriculum, Graduate Medical Regulation 2019.

He / She has satisfactorily attended/ completed all assignments mentioned in this logbook as per the guidelines prescribed by National Medical Commission.

Head of DepartmentofOrthopaedics

Signature with Date

BIODATA OF THE CANDIDATE

PHOTO

Name of the student:

Name of the course: MBBS

Date of birth:

Father's / Guardian's name:

Mother's name:

Blood group:

Permanent Address: Temporary Address:

…… ……

…….. ……..

Student's contact no:

Father's/ Guardian's contact no:

Student's Email id:

Father's/ Guardian's Email id:

Date: Candidates Signature: ……...

GENERAL INSTRUCTIONS

1) The logbook is a record of the academic / non-academic activities of the student. Each Medical student is responsible for maintaining their logbook.

2) This logbook is prepared as per the guidelines of NMC for implementation of Competency Based Curriculum for 4THProfessional MBBS students in the subject of Orthopaedics.

3) Students are instructed to keep their logbook entries up to date. It is the responsibility of the student to enter their activity in respective pages & get them duly signed by the supervising faculty.

4) Entries in the logbook will be in accordance with activities done in the department & have to be scrutinized by the Head of the department.

5) The logbook assessment will be based on multiple factors like
   - Overall presentation
   - Active participation in the sessions
   - Quality of write up of reflections.
   - Timely completions

- Attendance

6) The logbook shall be kept as record work of the candidate for the department & be submitted to department as a bonafide record of the candidate before appearing for the University examination.

NOTE:

1. A **clear record** of all components that add to the internal assessment marks needs to be maintained by the institution and retained by them for at least **2 years** after passing of the examination. Institutions may be asked to provide these details by the University as and when required.

The contents in the logbook are suggested guidelines. The institutions can make **necessary changes as per the needs.**

ATTENDANCE

Every candidate should have attendance not less than 75% of the total classes conducted in theory, practical and clinical jointly in each calendar year calculated from the date of commencement of the term to the last working day as notified by the University in each of the subjects prescribed to be eligible to appear for the university examinations.

For appearing at the University Examination, student should have minimum 75% attendance in each subject.

A candidate lacking in the prescribed attendance in any subject(s) should not be permitted to appear for the examination in that subject(s)

Students cannot appear in part or separately in individual subjects during the first appearance at the Professional examination.

The Principal should notify the attendance details at the end of each professional phase without fail under intimation to this University.

Self-Directed Learning, Seminars, Tutorials, Projects, Quizzes, extracurricular activities

Sr. No.	Self- directed learning (Seminars, Tutorials, Projects, Quizzes, Extracurricular activities)	Date	Phase III/I	Phase III/II	Signature of Teacher

Reflection (minimum 200 words) – 1
Date :

TOPIC:

Reflection (minimum 200 words) – 2
Date :

TOPIC:

LOGBOOK CLINICAL SKILLS : LIST OF COMPETENCIES

Clinical skills can be assessed by case presentation, case-based discussion, objective structured clinical assessment the checklist, MiniCex, as per the institutional preference.

Competency # addressed	Name of Activity
OR1.1	Describe and discuss the Principles of pre-hospital care and Casuality management of a trauma victim including principles of triage
OR1.2	Describe and discuss the aetiopathogenesis, clinical features, investigations, and principles of management of shock
OR1.3	Describe and discuss the aetiopathogenesis, clinical features, investigations, and principles of management of soft tissue injuries
OR1.4	Describe and discuss the Principles of management of soft tissue injuries
OR1.5	Describe and discuss the aetiopathogenesis, clinical features, investigations, and principles of management of dislocation of major joints, shoulder, knee, hip
OR2.6	Describe and discuss the aetiopathogenesis, mechanism of injury, clinical features, investigations and principles of management of fractures of distal radius
OR2.7	Describe and discuss the aetiopathogenesis, mechanism of injury, clinical features, investigations and principles of management of pelvic injuries with emphasis on hemodynamic instability
OR2.8	Describe and discuss the aetiopathogenesis, mechanism of injury, clinical features, investigations and principles of management of spine injuries with emphasis on mobilisation of the patient
OR2.11	Describe and discuss the aetiopathogenesis, mechanism of injury, clinical features, investigations and principles of management of (a) Fracture patella (b) Fracture distal femur (c) Fracture proximal tibia with special focus on neurovascular injury and compartment syndrome
OR2.12	Describe and discuss the aetiopathogenesis, clinical features, investigations and principles of management of Fracture shaft of femur in all age groups and the recognition and management of fat embolism as a complication
OR2.16	Describe and discuss the mechanism of injury, clinical features, investigations and principles of management of open fractures with focus on secondary infection prevention and management
OR3.1	Describe and discuss the aetiopathogenesis, clinical features, investigations and principles of management of Bone and Joint infections a) Acute Osteomyelitis b) Subacute osteomyelitis c) Acute Suppurative arthritis d) Septic arthritis & HIV infection
OR4.1	Describe and discuss the clinical features, Investigation and principles of management of Tuberculosis affecting major joints (Hip, Knee) including cold abcess and caries spine
OR7.1	Describe and discuss the aetiopathogenesis, clinical features, investigation and principles of management of metabolic bone disorders in particular osteoporosis, osteomalacia, rickets, Paget's disease
OR8.1	Describe and discuss the aetiopathogenesis, clinical features, assessment and principles of management a patient with Post Polio Residual Paralysis

OR10.1	Describe and discuss the aetiopathogenesis, clinical features, investigations and principles of management of benign and malignant bone tumours and pathological fractures

Integration	
Anatomy	
AN10.12	Describe and demonstrate Shoulder joint for– type, articular surfaces, capsule, synovial membrane, ligaments, relations, movements, muscles involved, blood supply, nerve supply and applied anatomy
AN18.6	Describe knee joint injuries with its applied anatomy
Pathology	
PA33.1	Classify and describe the etiology, pathogenesis, manifestations, radiologic and morphologic features and complications of osteomyelitis
PA33.2	Classify and describe the etiology, pathogenesis, manifestations, radiologic and morphologic features and complications of metastases of bone tumors
Microbiology	
MI4.2	Describe the etiopathogenesis, clinical course and discuss the laboratory diagnosis of bone & joint infections.

LOGBOOK PSYCHOMOTOR / PERFORMANCE SKILLS:

Skills can be assessed by objective structured clinical assessment with checklist, Global Rating Scale, Simulated patients as per the institutional preference.

Colleges are instructed prepare modules for skill training as per NMC guidelines.

Module 5 Skill Training.

LIST OF COMPETENCIES

Competency # addressed	Name of Activity
OR1.6	Participate as a member in the team for closed reduction of shoulder dislocation / hip dislocation / knee dislocation
OR3.2	Participate as a member in team for aspiration of joints under supervision.
OR3.3	Participate as a member in team for procedures like drainage of abscess, sequestrectomy/ saucerisation and arthrotomy
OR13.1	Participate in a team for procedures in patients and demonstrating the ability to perform on mannequins / simulated patients in the following: i. Above elbow plaster ii. Below knee plaster iii. Above knee plaster iv. Thomas splint v. splinting for long bone fractures vi. Strapping for shoulder and clavicle trauma
OR13.2	Participate as a member in team for Resuscitation of Polytrauma victim by doing all of the following : (a) I.V. access central - peripheral (b) Bladder catheterization (c) Endotracheal intubation (d) Splintage

LOGBOOK FOR AETCOM SKILLS

Counselling for Investigation, Treatment, Prognosis, Blood donation, Organ Donation, Breaking Bad news. All types of consent. Medicolegal aspects and Ethics, Empathy and professionalism as per the Phase of the MBBS. Include cases of Allied branches also.

Competency to be assessed during Clinical postings and /or small group discussions.

LIST OF COMPETENCIES FOR AETCOM

Competency addressed	**Name of Activity**
OR14.1	Demonstrate the ability to counsel patients regarding prognosis in patients with various orthopedic illnesses like a. fractures with disabilities b. fractures that require prolonged bed stay c. bone tumours d. congenital disabilities
OR14.2	Demonstrate the ability to counsel patients to obtain consent for various orthopedic procedures like limp amputation, permanent fixations etc..
OR14.3	Demonstrate the ability to convince the patient for referral to a higher centre in various orthopedic illnesses, based on the detection of warning signals and need for sophisticated management.

PHASE II-clinical (minimum three assessments)

Sr. No.	Competency # addressed	Name of Activity	Site Ward, skill lab, opd, casualty,	Date completed	Attempt at activity First (F) Repeat (R) Remedial (Re)	Rating Below (B)expectations Meets (M)expectations Exceeds (E) expectations OR Numerical Score	Decision of faculty Completed (C) Repeat (R) Remedial (Re)	Initial of faculty	Feedback received Initial of Learner	Method of assessment and Score
1.										
2.										
3.										
4.										
5.										
6.										

PHASE II-Psychomotor

Sr. No.	Competency # addressed	Name of Activity	Site Ward, skill lab, opd , casualty ,	Date completed	Attempt at activity First (F) Repeat (R) Remedial (Re)	Rating Below (B)expectations Meets (M) expectations Exceeds (E) expectations OR Numerical Score	Decision of faculty Completed (C) Repeat (R) Remedial (Re)	Initial of faculty	Feedback received Initial of Learner	Method of assessment and Score
1.										
2.										
3.										
4.										
5.										
Sr. No.	Competency # addressed	Name of Activity	Site Ward, skill lab, opd , casualty ,	Date completed	Attempt at activity First (F) Repeat (R) Remedial (Re)	Rating Below (B) expectations Meets (M) expectations Exceeds (E) expectations OR Numerical Score	Decision of faculty Completed (C) Repeat (R) Remedial (Re)	Initial of faculty	Feedback received Initial of Learner	Method of assessment and Score
6.										
7.										
8.										
9.										
10.										
11.										
12.										

PHASE II- AetCom(Minimum three assessments)

Sr. No	Competency # addressed	Name of Activity	Site Ward, skill lab, opd , casualty ,	Date com plete d	Attempt at activity First (F) Repeat (R) Remedial (Re)	Rating Below (B) expectations Meets (M) expectations Exceeds (E) expectations OR Numerical Score	Decision of faculty Complete d (C) Repeat (R) Remedial (Re)	Initial of facult y	Feedbac k received Initial of Learner	Method of assessmen t and Score
1.										
2.										
3.										
4.										
5.										
6.										

PHASE III Part I -clinical (Minimum three assessments)

Sr. No.	Competency # addressed	Name of Activity	Site Ward, skill lab, opd , casualty,	Date completed	Attempt at activity First (F) Repeat (R) Remedial (Re)	Rating Below (B) expectations Meets (M)expectations Exceeds (E) expectations OR Numerical Score	Decision of faculty Completed (C) Repeat (R) Remedial (Re)	Initial of faculty	Feedback received Initial of Learner	Method of assessment and Score
1.										
2.										
3.										
4.										
5.										
6.										

PHASE III Part I-Psychomotor skill

Sr. No.	Competency # addressed	Name of Activity	Site Ward, skill lab, opd, casualty,	Date completed	Attempt at activity First (F) Repeat (R) Remedial (Re)	Rating Below (B) expectations Meets (M)expectations Exceeds (E) expectations OR Numerical Score	Decision of faculty Completed (C) Repeat (R) Remedial (Re)	Initial of faculty	Feedback received Initial of Learner	Method of assessment and Score
1.										
2.										
3.										
4.										
5.										
Sr. No.	Competency # addressed	Name of Activity	Site Ward, skill lab, opd, casualty,	Date completed	Attempt at activity First (F) Repeat (R) Remedial (Re)	Rating Below (B)expectations Meets (M)expectations Exceeds (E) expectations OR Numerical Score	Decision of faculty Completed (C) Repeat (R) Remedial (Re)	Initial of faculty	Feedback received Initial of Learner	Method of assessment and Score
6.										
7.										
8.										
9.										
10.										
11.										
12.										

PHASE III Part I - AetCom (Minimum three assessments)

Sr. No.	Competency # addressed	Name of Activity	Site Ward, skill lab, opd , casualty ,	Date completed	Attempt at activity First (F) Repeat (R) Remedial (Re)	Rating Below (B) expectations Meets (M)expectations Exceeds (E) expectations OR Numerical Score	Decision of faculty Completed (C) Repeat (R) Remedial (Re)	Initial of faculty	Feedback received Initial of Learner	Method of assessment and Score
1.										
2.										
3.										
4.										
5.										
6.										

PHASE III Part II -clinical (minimum three assessments)

Sr. No.	Competency # addressed	Name of Activity	Site Ward, skill lab, opd , casualty,	Date completed	Attempt at activity First (F) Repeat (R) Remedial (Re)	Rating Below (B)expectations Meets (M)expectations Exceeds (E) expectations OR Numerical Score	Decision of faculty Completed (C) Repeat (R) Remedial (Re)	Initial of faculty	Feedback received Initial of Learner	Method of assessment and Score
1.										
2.										
3.										
4.										
5.										
6.										

PHASE III Part II -Psychomotor skill

Sr. No.	Competency # addressed	Name of Activity	Site Ward, skill lab, opd , casualty,	Date completed	Attempt at activity First (F) Repeat (R) Remedial (Re)	Rating Below (B) expectations Meets (M) expectations Exceeds (E) expectations OR Numerical Score	Decision of faculty Completed (C) Repeat (R) Remedial (Re)	Initial of faculty	Feedback received Initial of Learner	Method of assessment and Score
1.										
2.										
3.										
4.										
5.										
Sr. No.	**Competency # addressed**	**Name of Activity**	**Site Ward, skill lab, opd , casualty,**	**Date completed**	**Attempt at activity First (F) Repeat (R) Remedial (Re)**	**Rating Below (B) expectations Meets (M) expectations Exceeds (E) expectations OR Numerical Score**	**Decision of faculty Completed (C) Repeat (R) Remedial (Re)**	**Initial of faculty**	**Feedback received Initial of Learner**	**Method of assessment and Score**
6.										
7.										
8.										
9.										
10.										
11.										
12.										

PHASE III Part II - AetCom (Minimum three assessments)

Sr. No.	Competency # addressed	Name of Activity	Site Ward, skill lab, opd , casualty ,	Date completed	Attempt at activity First (F) Repeat (R) Remedial (Re)	Rating Below (B) expectations Meets (M)expectations Exceeds (E) expectations OR Numerical Score	Decision of faculty Completed (C) Repeat (R) Remedial (Re)	Initial of faculty	Feedback received Initial of Learner	Method of assessment and Score
1.										
2.										
3.										
4.										
5.										
6.										
7.										

REFLECTION ON AETCOM MODULE For PHASE III/II

Module 4.5 - Case studies in ethics: The doctor- industry relationship

Competency addressed	*Level*
Identify and discuss amd defend medico-legal, socio-cultural, professional and ethical issues in physician- industry relationship	*KH*

Reflection (minimum 200 words) -1
Date:

Signature of Teacher-in-charge

ANNEXURE 2:

AETCOM skills can be assessed by use of Kalamazoo consensus.

Criteria
Builds relationship
Opens the discussion
Gathers information
Understands the patient's perspective
Shares information
Manages flow
Overall rating
Signature of teacher

Rating 1-3 - Poor, 4 -6 Satisfactory, 6 -10 Superior

Communication skills rating scale adapted from Kalamazoo consensus statement.

Paper wise distribution of topics for Prelim & MUHS Annual Examination

Year: III-II MBBS Subject: Orthopaedics

Paper	Section	Topics
II (General Surgery)	A	MCQs on all topics of the paper II of general surgery will include **orthopaedics**
	C	Skeletal Trauma, Poly trauma
		Fractures
		MusculoskeletalInfection
		SkeletalTuberculosis
		Rheumatoid Arthritis and associated inflammatory disorders
		Degenerative disorders
		Metabolicbonedisorders
		Poliomyelitis
		CerebralPalsy
		BoneTumors
		Peripheralnerveinjuries
		Congenitallesions

Competency Based Medical Education

Year: Second/ III-I/ III-II MBBS

Subject: Orthopaedics

Learning Resource Material

Sr.no.	Author	Title of book/ Material	Publisher
		TEXTBOOK	
1.	Maheshwari &Mhaskar	Essential Orthopaedics	JayPee Brothers Medical Publishers
2.	Anil Jain	Turek'sOrthopaedics Principles & their Applications	Wolters Kluwer
3.	Anand Thakur	The Elements of Fracture Fixation	Elsevier
4.	John Ebnezar	Textbook of Orthopedics	JayPee Brothers Medical Publishers
5.	Ashley Blom, David Warwick, Michael Whitehouse	Apley& Solomon's System of Orthopaedics& Trauma	Productivity Press
6.	Kenneth Egol, Kenneth Koval, Joseph Zuckerman	Handbook of Fractures	Wolters Kluwer
		CLINICAL ORTHOPAEDICS	
1.	S Das	A Manual on Clinical Surgery 9th Edition 2019	DAS Publications
2.	Vivek Pandey, Hitesh Shah	Musculoskeletal Examination	JayPee Brothers Medical Publishers
		REFERENCES	
1.	Frederick Azar, James Beaty	Campbell's Operative Orthopaedics	Elsevier
2.	Charles Court-Brown, James Heckman, Margaret McQueen, William Ricci, Paul Tornetta III	Rockwood & Green's Fractures in Adults and Children	Lippincott Williams and Wilkins
3.	Shrikant Gore	Orthopaedics for Undergraduates as per M.C. I's. Competency based curriculum	Maharudra Mangnale Muktrang Prakashan ,

	AS3.4	Choose and interpret appropriate testing for patients undergoing Surgery	Bedside Cliinc			General Surgery
	AS3.5	Determine the readiness for General Surgery in a patient based on the preoperative evaluation	Bedside Cliinc			General Surgery
	AS3.6	Choose and write a prescription for appropriate premedications for patients undergoing surgery	Bedside Cliinc		Pharmacology	
2	**General Anaesthesia**					
	AS4.3	Observe and describe the principles and the practical aspects of induction and maintenance of anesthesia	Bedside Cliinc		Pharmacology	
	AS4.4	Observe and describe the principles and the steps/ techniques in maintenance of vital organ functions in patients undergoing surgical procedures	Bedside Cliinc			
	AS4.5	Observe and describe the principles and the steps/ techniques in monitoring patients during anaesthesia	Bedside Cliinc			
3	**Regional Anaesthesia**					
	AS5.1	Enumerate the indications for and describe the principles of regional anaesthesia (including spinal, epidural and combined)	Bedside Cliinc			

4	**Regional Anaesthesia**					
	AS5.6	Observe and describe the principles and steps/ techniques involved in common blocks used in surgery (including brachial plexus blocks)	Bedside Cliinc			General Surgery
5	**Post-anaesthesia Recovery**					
	AS6.1	Describe the principles of monitoring and resuscitation in the recovery room	Bedside Cliinc			

	AS6.2	Observe and enumerate the contents of the crash cart and describe the equipment used in the recovery room	Bedside Cliinc			
6	**Intensive Care Management**					
	AS7.3	Observe and describe the management of an unconscious patient	Bedside Cliinc		Physiology	General Medicine
	AS7.5	Observe and describe the principles of monitoring in an ICU	Bedside Cliinc			General Medicine
7	**Fluids**					
	AS9.3	Describe the principles of fluid therapy in the preoperative period	Bedside Cliinc			General Surgery
	AS9.4	Enumerate blood products and describe the use of blood products in the preoperative period	Bedside Cliinc		Pathology	General Surgery
8	**Patient Safety**					
	AS10.3	Describe the role of communication in patient safety	Bedside Cliinc		AETCOM	General Surgery
	AS10.4	Define and describe common medical and medication errors in anaesthesia	Bedside Cliinc		Pharmacology	General Medicine
9	**Cardiopulmonary Resuscitation**					
	AS2.1	Enumerate the indications, describe the steps and demonstrate in a simulated environment, Basic Life Support in adults, children and neonates	DOAP Session			General Medicine, Pediatrics
	AS2.2	Enumerate the indications, describe the steps and demonstrate in a simulated environment, Advanced Life Support in adults and children	DOAP Session			General Medicine

D. UG curriculum for small group teaching total no. of classes (hours): 10 – (30 Competencies)

Sr. No.	Number of Competencies	Competencies	Suggested Teaching learning method	Hour	Vertical integration	Horizontal integration
1	**Cardiopulmonary Resuscitation**		Small Group Discussion, DOAP Session	1		General Medicine, Paediatrics
	AS2.1	Enumerate the indications, describe the steps and demonstrate in a simulated environment, Basic Life Support in adults, children and neonates				
	AS2.2	Enumerate the indications, describe the steps and demonstrate in a simulated environment, Advanced Life Support in adults and children	Small Group Discussion, DOAP Session			General Medicine, Paediatrics
2	**Preoperative evaluation and medication**		DOAP Session	1		General Surgery, General Medicine
	AS3.2	Elicit, present and document an appropriate history including medication history in a patient undergoing Surgery as it pertains to a preoperative anaesthetic evaluation				
	AS3.3	Demonstrate and document an appropriate clinical examination in a patient undergoing General Surgery	DOAP Session			General Surgery
	AS3.4	Choose and interpret appropriate testing for patients undergoing Surgery	Small Group Discussion			General Surgery
	AS3.5	Determine the readiness for General Surgery in a patient based on the preoperative evaluation	Small Group Discussion			General Surgery
	AS3.6	Choose and write a prescription for appropriate premedications for patients undergoing surgery	Small Group Discussion		Pharmacology	
3	**General Anaesthesia**		Small Group Discussion	1	Pharmacology	
	AS4.3	Observe and describe the principles and the practical aspects of induction and maintenance of anesthesia				

	AS4.4	Observe and describe the principles and the steps/	Small Group			

		techniques in maintenance of vital organ functions in patients undergoing surgical procedures	Discussion			
	AS4.5	Observe and describe the principles and the steps/ techniques in monitoring patients during anaesthesia	Small Group Discussion			
	AS4.6	Observe and describe the principles and the steps/ techniques involved in day care anesthesia	Small Group Discussion			
	AS4.7	Observe and describe the principles and the steps/ techniques involved in anaesthesia outside the operating room	Small Group Discussion			
4	**Regional Anaesthesia**		Small Group Discussion, DOAP Session	1	Human Anatomy	
	AS5.3	Observe and describe the principles and steps/ techniques involved in peripheral nerve blocks				
	AS5.4	Observe and describe the pharmacology and correct use of commonly used drugs and adjuvant agents in regional anesthesia	Small Group Discussion		Pharmacology	
	AS5.5	Observe and describe the principles and steps/ techniques involved in caudal epidural in adults and children	Small Group Discussion, DOAP Session			
	AS5.6	Observe and describe the principles and steps/ techniques involved in common blocks used in surgery (including brachial plexus blocks)	Small Group Discussion, DOAP Session			General Surgery
5	**Post-anaesthesia Recovery**		Small Group Discussion	1		
	AS6.1	Describe the principles of monitoring and resuscitation in the recovery room				
	AS6.2	Observe and enumerate the contents of the crash cart and describe the equipment used in the recovery room	Small Group Discussion			

6	**Intensive Care Management**		Small Group Discussion	1		
	AS7.1	Visit, enumerate and describe the functions of an Intensive Care Unit				
	AS7.2	Enumerate and describe the criteria for admission and discharge of a patient to an ICU	Small Group Discussion			General Medicine
	AS7.3	Observe and describe the management of an unconscious patient	Small Group Discussion		Physiology	General Medicine
7	**Intensive Care Management**		Small Group Discussion	1	Physiology	General Medicine
	AS7.4	Observe and describe the basic setup process of a ventilator				
	AS7.5	Observe and describe the principles of monitoring in an ICU	Small Group Discussion			General Medicine
8	**Pain and its management**		Small Group Discussion, DOAP Session	1	Physiology	
	AS8.2	Elicit and determine the level, quality and quantity of pain and its tolerance in patient or surrogate				
9	**Fluids**		Small Group Discussion, DOAP Session	1		
	AS9.1	Establish intravenous access in a simulated environment				
	AS9.2	Establish central venous access in a simulated environment	Small Group Discussion, DOAP Session			
10	**Patient Safety**		Small Group Discussion			
	AS10.1	Enumerate the hazards of incorrect patient positioning				
	AS10.2	Enumerate the hazards encountered in the perioperative period and steps/techniques taken to prevent them	Small Group Discussion			
	AS10.3	Describe the role of communication in patient safety	Small Group Discussion		AETCOM	General Surgery

	AS10.4	Define and describe common medical and medication errors in anaesthesia	Small Group Discussion		Pharmacology	General Medicine

Dividing Competencies into
Lectures and Small Group Discussion/Bedside Clinics/DOAP Session

Sr. No.	Competency No.	Total	Dividing Competencies into			
			Lectures	Total	Small Group Discussion/Bedside Clinics/DOAP Session	Total
1	AS1.1, AS1.2, AS1.3, AS1.4	4	AS1.1, AS1.2, AS1.3, AS1.4	4		
2	AS2.1, AS2.2	2			AS2.1, AS2.2	2
3	AS3.1, AS3.2, AS3.3, AS3.4, AS3.5, AS3.6	6	AS3.1	1	AS3.2, AS3.3, AS3.4, AS3.5, AS3.6	5
4	AS4.1, AS4.2, AS4.3, AS4.4, AS4.5, AS4.6, AS4.7	7	AS4.1, AS4.2	2	AS4.3, AS4.4, AS4.5, AS4.6, AS4.7	5
5	AS5.1, AS5.2, AS5.3, AS5.4, AS5.5, AS5.6	6	AS5.1, AS5.2	2	AS5.3, AS5.4, AS5.5, AS5.6	4
6	AS6.1, AS6.2, AS6.3	3	AS6.3	1	AS6.1, AS6.2	2
7	AS7.1, AS7.2, AS7.3, AS7.4, AS7.5	5			AS7.1, AS7.2, AS7.3	3
					AS7.4, AS7.5	2
8	AS8.1, AS8.2, AS8.3,AS8.4, AS8.5	5	AS8.1, AS8.3	2	AS8.2	1
			AS8.4, AS8.5	2		
9	AS9.1, AS9.2, AS9.3, AS9.4	4	AS9.3, AS9..4	2	AS9.1, AS9.2	2
10	AS10.1, AS10.2, AS10.3, AS10.4	4			AS10.1, AS10.2, AS10.3, AS10.4	4
		46		16		30

Competency Based Medical Education

Year: III-I MBBS

Subject: **Anaesthesiology**

LEARNING RESOURCE MATERIAL

Sr. No.	Author	Title of book/ Material	Publisher
1.	John F. Butterworth, John D. Wasnick, David C. Mackey	Morgan & Mikhail's Clinical Anesthesiology	Lange
2.	R. S. Atkinson	Lee's Synopsis of Anaesthesia	Elsevier
3.	Ajay Yadav	Short Textbook of Anesthesia	Jaypee, The Health Sciences Publisher - London, New Delhi, Panama
4.	Ronald D. Miller	Miller's Anesthesia	

INTERNAL ASSESSMENT EXAM IN ANASTHESIOLOGY

End of the posting examto be conducted for 25 marks and to be submitted to department of General Surgery during respective phase of teaching. Refer to surgery Syllabus for details.

Dentistry

For theory Competencies included in Surgery Syllabus

Clinical Postings-3 days

Day	Competency no.	Topic	Hours
1	DE1.3, DE1.5, DE2.3, DE2.5, DE3.3, DE3.4	Identify dental caries, malocclusion, complete compliment of teeth and identify missing teeth, counsel the patients with respect to correction of malocclusion and the role it might have on oral health specifically on the TMJ, counsel the patients with respect to oral hygiene, diet and the direct bearing on systemic health and vice versa, Counsel the patients on the importance of restoring missing teeth with respect to benefits on oral and systemic hygiene.	3 hrs
2	DE4.3, DE4.4	Identify potential precancerous/cancerous lesions, Counsel patients about oral cancers with respect to tobacco smoking, alcohol and other causative factors.	3 hrs
3	DE5.3, DE5.4, DE5.5	Identify periodontal disease, discuss the role of periodontal disease as a focus of sepsis, counsel the patients with respect to oral hygiene, diet and the direct bearing on systemic health and vice versa	3 hrs

RADIODIAGNOSIS

Course Content

Second / III-I/ III-II MBBS

Subject : Radio Diagnosis Theory / Practical

(Based on Medical Council of India, Competency based Undergraduate curriculum for the Indian Medical Graduate, 2018. Vol. 2 / 3; page nos. 161 to166)

1. Total Teaching hours :20

A. Lectures (hours): 10 B. Self directed learning (hours) : 2

C. Small group teachings/tutorials/Integrated teaching/Practicals (hours)**: 8** hours

D. Clinical Postings (hours): 2 weeks (3hours /day x 12 days Monday to Saturday

Term I/II

A. Lectures/ Large Group Teachings Total Number of Competencies: 13
In institutes where radiotherapy facility is available 2 hours will be allotted to Radiotherapy department. Time Table in these institutes will be prepared by Radio Diagnosis and Radiotherapy department in joint collaboration

Serial No.	Competency Nos.	Topics & Subtopics	Suggested Teaching Method	Hours	Vertical Integration	Horizontal Integration
LEC 1	RD1.1	Define radiation and the interaction of radiation and importance of radiation protection	Lecture, Demonstration	1		
	RD1.2	Describe the evolution of Radiodiagnosis. Identify various radiological equipmentsIn the current era				
LEC 2	RD1.3	Enumerate indications for various common radiological investigations, choose the most appropriate and cost effective method and	Lecture, Demonstration	1		ENT

Serial No.	Competency Nos.	Topics & Subtopics	Suggested Teaching Method	Hours	Vertical Integration	Horizontal Integration
		interpret findings in common conditions pertaining to disorder of ENT				
LEC 3	RD1.4	Enumerate indications for various common radiological investigations, choose the most appropriate and cost effective method and interpret findings in common conditions pertaining todisorder in Ob &Gy	Lecture, Demonstration	1		Obstetrics &Gynaecology
	RD1.12	Describe the effects of radiation in pregnancy and the methods of prevention/ minimization of radiation exposure				
	RD1.13	Describe the components of the PC & PNDT Act and its medicolegal implications				
LEC 4	RD1.5	Enumerate indications for various common radiological investigations, choose the most appropriate and cost effective method and interpret findings in common conditions pertaining to disorder in internal medicine				Medicine
LEC 5	RD1.6	Enumerate indications for various common radiological investigations, choose the most appropriate and cost effective method and interpret findings in common conditions pertaining to				Surgery

Serial No.	Competency Nos.	Topics & Subtopics	Suggested Teaching Method	Hours	Vertical Integration	Horizontal Integration
		disorderls in surgery				
LEC 6	RD1.7	Enumerate indications for various common radiological investigations, choose the most appropriate and cost effective method and interpret findings in common conditions pertaining to disorder in Pediatrics				Pediatrics
LEC 7	RD1.8	Enumerate indications for various common radiological investigations, choose the most appropriate and cost effective method and interpret findings in common conditions pertaining to common malignancies				All clinical departments
LEC 8	RD1.9	Describe the role of Interventional Radiology in common clinical conditions				All clinical departments
LEC 9	RD1.10	Describe the role of Emergency Radiology, miscellaneous & applied aspects, interaction with clinical departments				All clinical departments
LEC 10	RD1.11	Describe preparation of patient for common imaging procedures	Lecture, Demonstration			All clinical departments
B – Self Directed Learning 2 hours						

Serial No.	Competency Nos.	Topics & Subtopics	Suggested Teaching Method	Hours	Vertical Integration	Horizontal Integration
Serial No.	**Competency No.**	**Topics & Sub Topics**	**Suggested Teaching Method**	**Hours**	**Vertical Integration**	**Horizontal Integration**
SDL 1	RD1.5	Enumerate indications for various common radiological investigations, choose the most appropriate and cost effective method and interpret findings in common conditions pertaining to disorder in internal medicine	Small group discussion, Quiz, etc	1		All clinical departments
	RD1.10	Describe the role of Emergency Radiology, miscellaneous & applied aspects, interaction with clinical departments	Small group discussion, Quiz, etc			
SDL 2	RD1.4	Enumerate indications for various common radiological investigations, choose the most appropriate and cost effective method and interpret findings in common conditions pertaining todisorder in Ob &Gy	Small group discussion, Quiz, etc	1		Obstetrics &Gynaecology
	RD1.13	Describe the components of the PC & PNDT Act and its medicolegal implications				
	RD1.1	Define radiation and the interaction of radiation and importance of radiation protection				
C	C. **Small group teachings/tutorials/Integrated teaching/Practicals(hours): 8 hours**					
Serial No.	**Competency No.**	**Topics & Sub**	**Suggested**	**Hours**	**Vertical**	**Horizontal**

Serial No.	Competency Nos.	Topics & Subtopics	Suggested Teaching Method	Hours	Vertical Integration	Horizontal Integration
		Topics	**Teaching Method**		**Integration**	**Integration**
SGT 1	AN20.6, AN25.7, AN43.7, AN43.9, AN51.1, AN51.2, IM7.18	Identify anatomical parts on radiographic images	Lecture/ Small group discussion	**3**		**Anatomy & All Clinical Departments**
SGT 2	AN25.8, AN54.2	Role of Barium Studies in gastro Intestinal Tract Evaluation	Lecture/ Small group discussion	3		Medicine, Surgery
SGT 3	FM1.9	Medicolegal aspects in Radiology	Lecture/ Small group discussion	1		Forensic Medicine
SGT 4	IM1.19, IM3.7, IM3.11, M13.12, PE34.8, PE23.13	Role of Radiology in Chest Diseases	Lecture/ Small group discussion	1		Medicine, Pediatrics
SGT 5	SU25.3	Role of Radiology in Breast Diseases	Lecture/ Small group discussion	1		Surgery
SGT 6	PE28.17	Role of Radiology in Ear Nose Throat and Eye Diseases	Lecture/ Small group discussion	1		ENT &Opthalmology
SGT 7	IM10.19, PE21.12, IM10.19, AN54.2	Role of Radiology in Diseases of the Genito Urinary System	Lecture/ Small group discussion	1		Medicine
SGT 8	IM19.7, PE30.23, IM6.12, AN43.7, AN43.8, AN43.9	Role of Radiology in Central Nervous System	Lecture/ Small group discussion	1		Medicine, Surgery, Pediatrics,

Serial No.	Competency Nos.	Topics & Subtopics	Suggested Teaching Method	Hours	Vertical Integration	Horizontal Integration
		Diseases				
D	**D.** Clinical Postings(hours): 2 weeks (3hours /day x 12 days Monday to Saturday. **In institutes where radiotherapy facility is available 6 hours will be allotted to Radiotherapy department. Time Table in these institutes will be prepared by Radio Diagnosis and Radiotherapy department in joint collaboration**					
CP 1	RD1.1 RD1.2	Introduction to All modalities under Radiodiagnosis and Radiation Protection.	Lecture, Demonstration, Small group teaching	**1**		
CP 2	RD1.5	Role of Radiology in Chest Conditions lungs and heart	Lecture, Demonstration, Small group teaching			Medicine and Pediatrics
CP 3	RD1.6	Role of Radiology in Abdominal Conditions hepatobilary system and Gastrointestinal System	Lecture, Demonstration, Small group teaching	3		Surgery
CP 4	RD1.6	Role of Radiology in Abdominal Conditions - Genitourinary system	Lecture, Demonstration, Small group teaching	3		Surgery
CP 5	RD1.4 & RD 1.5	Role of Radiology in Obstetrics and Gynaecolgy	Demonstration, Small group teaching	3		Obstetrics & Gynecology
CP 6	RD1.6	Role of	Demonstration,	3		Orthopedics

Serial No.	Competency Nos.	Topics & Subtopics	Suggested Teaching Method	Hours	Vertical Integration	Horizontal Integration
		Radiology in Musculoskeletal system	Small group teaching			
CP 7	RD1.6	Role of Radiology in Diseases of Central Nervous System	Demonstration, Small group teaching	3		All clinical Branches
CP 8	RD1.2	Basic Principles of Computed Tomography	Demonstration, Small group teaching	**3**		
CP 9	RD1.2	Basic Principles of Magnetic Resonance Imaging	Demonstration, Small group teaching	**3**		
CP 10	RD1.1	Radiation Hazards and Radiation Protection	Demonstration, Small group teaching	3		
CP 11	RT	Radiotherapy related topics	Radiotherapy related topics	3		
CP 12	RT	Radiotherapy related topics	Radiotherapy related topics	3		

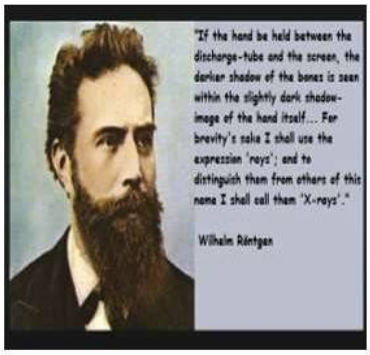
Learning Resource Material

Sr.no.	Author	Title of book/ Material	Publisher
1	David Sutton	Text Book of Radiology and Medical Imaging for Medical Students Seventh Edition	Elseivier
2	David Sutton	Text Book of Radiology & Imaging Students Seventh Edition	Elseivier
3	Grainger Allison	Diagnostic Radiology	Elseivier

Name of the Institute

LOG BOOK

DEPARTMENT OF RADIODIAGNOSIS



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3	SELF DIRECTED LEARNING / TUTORIALS / SEMINARS / EXTRA CURRICULAR ACTIVITIES	06
4	LIST OF COMPETENCIES	08
5	PHASE III/I	10

RADIODIAGNOSIS LOGBOOK CERTIFICATE

This is to certify that this logbook is the bonafide record of Mr. / Ms..... Roll No…….. Admission Year …….……, of the Department of RadioDiagnosis at …….…… …….……. Medical College.

The logbook is as per the guidelines of Competency Based Undergraduate Medical Education Curriculum, Graduate Medical Regulation 2019.

He / She has satisfactorily attended/ completed all assignments mentioned in this logbook as per the guidelines prescribed by National Medical Commission.

Head of Department
Department of Radio Diagnosis
Signature with Date

INTERNAL ASSESSMENT EXAMINATION IN RADIODIAGNOSIS

End of the posting exam to be conducted for 25 marks and to be submitted to department of General Surgery during respective phase of teaching. Refer to Surgery Syllabus for details.

Self-Directed Learning: Seminars, Tutorials, Projects, Quizzes,

Extra-curricular activities

Sr. No.	Self- directed learning (Seminars, Tutorials, Projects, Quizzes, Extracurricular activities)	Date	Phase III/I	Signature of Teacher
1				
2				

Reflection (minimum 200 words) 1
Date:

TOPIC:

LOGBOOK CLINICAL SKILLS : LIST OF COMPETENCIES

Clinical skills can be assessed by case presentation, case-based discussion, objective structured clinical assessment the checklist, MiniCex, as per the institutional preference.

Sr. No	Competencies Addressed	Name of the Activity
1	PE21.12	How will you interpret a KUB Report?
2	PE23.13	How will you report a Chest radiograph and rule out cardiomegaly?
3	PE23.16	How will you use the ECHO reports in management of case of Cardiac disease ?
4	PE30.23	How will you interpret CT scan and MRI Report?

Radiotherapy

For theory Competencies to be included in Surgery & Radiology Syllabus

Clinical Postings-3 days where ever department exists

BOOKS RECOMMENDED:

REFERENCE BOOKS:

1) Hardikar's Orthopaedics Operations Text and Atlas by- Shrinivas S. Shintre, Sharad M. Hardikar, Vijay M. Panchandikar

RADIODIAGNOSIS

Course Content

Second / III-I/ III-II MBBS

Subject : Radio Diagnosis Theory / Practical

(Based on Medical Council of India, Competency based Undergraduate curriculum for the Indian Medical Graduate, 2018. Vol. 2 / 3; page nos. 161 to166)

1. Total Teaching hours :20

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C. Small group teachings/tutorials/Integrated teaching/Practicals (hours)**: 8** hours

D. Clinical Postings (hours): 2 weeks (3hours /day x 12 days Monday to Saturday

Term I/II

A. Lectures/ Large Group Teachings Total Number of Competencies: 13
In institutes where radiotherapy facility is available 2 hours will be allotted to Radiotherapy department. Time Table in these institutes will be prepared by Radio Diagnosis and Radiotherapy department in joint collaboration

Serial No.	Competency Nos.	Topics & Subtopics	Suggested Teaching Method	Hours	Vertical Integration	Horizontal Integration
LEC 1	RD1.1	Define radiation and the interaction of radiation and importance of radiation protection	Lecture, Demonstration	1		
	RD1.2	Describe the evolution of Radiodiagnosis. Identify various radiological equipmentsIn the current era				
LEC 2	RD1.3	Enumerate indications for various common radiological investigations, choose the most appropriate and cost effective method and	Lecture, Demonstration	1		ENT

Serial No.	Competency Nos.	Topics & Subtopics	Suggested Teaching Method	Hours	Vertical Integration	Horizontal Integration
		interpret findings in common conditions pertaining to disorder of ENT				
LEC 3	RD1.4	Enumerate indications for various common radiological investigations, choose the most appropriate and cost effective method and interpret findings in common conditions pertaining todisorder in Ob &Gy	Lecture, Demonstration	1		Obstetrics &Gynaecology
	RD1.12	Describe the effects of radiation in pregnancy and the methods of prevention/ minimization of radiation exposure				
	RD1.13	Describe the components of the PC & PNDT Act and its medicolegal implications				
LEC 4	RD1.5	Enumerate indications for various common radiological investigations, choose the most appropriate and cost effective method and interpret findings in common conditions pertaining to disorder in internal medicine				Medicine
LEC 5	RD1.6	Enumerate indications for various common radiological investigations, choose the most appropriate and cost effective method and interpret findings in common conditions pertaining to				Surgery

Serial No.	Competency Nos.	Topics & Subtopics	Suggested Teaching Method	Hours	Vertical Integration	Horizontal Integration
		disorderls in surgery				
LEC 6	RD1.7	Enumerate indications for various common radiological investigations, choose the most appropriate and cost effective method and interpret findings in common conditions pertaining to disorder in Pediatrics				Pediatrics
LEC 7	RD1.8	Enumerate indications for various common radiological investigations, choose the most appropriate and cost effective method and interpret findings in common conditions pertaining to common malignancies				All clinical departments
LEC 8	RD1.9	Describe the role of Interventional Radiology in common clinical conditions				All clinical departments
LEC 9	RD1.10	Describe the role of Emergency Radiology, miscellaneous & applied aspects, interaction with clinical departments				All clinical departments
LEC 10	RD1.11	Describe preparation of patient for common imaging procedures	Lecture, Demonstration			All clinical departments
B – Self Directed Learning 2 hours						

Serial No.	Competency Nos.	Topics & Subtopics	Suggested Teaching Method	Hours	Vertical Integration	Horizontal Integration
Serial No.	**Competency No.**	**Topics & Sub Topics**	**Suggested Teaching Method**	**Hours**	**Vertical Integration**	**Horizontal Integration**
SDL 1	RD1.5	Enumerate indications for various common radiological investigations, choose the most appropriate and cost effective method and interpret findings in common conditions pertaining to disorder in internal medicine	Small group discussion, Quiz, etc	1		All clinical departments
	RD1.10	Describe the role of Emergency Radiology, miscellaneous & applied aspects, interaction with clinical departments	Small group discussion, Quiz, etc			
SDL 2	RD1.4	Enumerate indications for various common radiological investigations, choose the most appropriate and cost effective method and interpret findings in common conditions pertaining todisorder in Ob &Gy	Small group discussion, Quiz, etc	1		Obstetrics &Gynaecology
	RD1.13	Describe the components of the PC & PNDT Act and its medicolegal implications				
	RD1.1	Define radiation and the interaction of radiation and importance of radiation protection				
C	C. **Small group teachings/tutorials/Integrated teaching/Practicals(hours): 8 hours**					
Serial No.	**Competency No.**	**Topics & Sub**	**Suggested**	**Hours**	**Vertical**	**Horizontal**

Serial No.	Competency Nos.	Topics & Subtopics	Suggested Teaching Method	Hours	Vertical Integration	Horizontal Integration
		Topics	**Teaching Method**		**Integration**	**Integration**
SGT 1	AN20.6, AN25.7, AN43.7, AN43.9, AN51.1, AN51.2, IM7.18	Identify anatomical parts on radiographic images	Lecture/ Small group discussion	**3**		**Anatomy & All Clinical Departments**
SGT 2	AN25.8, AN54.2	Role of Barium Studies in gastro Intestinal Tract Evaluation	Lecture/ Small group discussion	3		Medicine, Surgery
SGT 3	FM1.9	Medicolegal aspects in Radiology	Lecture/ Small group discussion	1		Forensic Medicine
SGT 4	IM1.19, IM3.7, IM3.11, M13.12, PE34.8, PE23.13	Role of Radiology in Chest Diseases	Lecture/ Small group discussion	1		Medicine, Pediatrics
SGT 5	SU25.3	Role of Radiology in Breast Diseases	Lecture/ Small group discussion	1		Surgery
SGT 6	PE28.17	Role of Radiology in Ear Nose Throat and Eye Diseases	Lecture/ Small group discussion	1		ENT &Opthalmology
SGT 7	IM10.19, PE21.12, IM10.19, AN54.2	Role of Radiology in Diseases of the Genito Urinary System	Lecture/ Small group discussion	1		Medicine
SGT 8	IM19.7, PE30.23, IM6.12, AN43.7, AN43.8, AN43.9	Role of Radiology in Central Nervous System	Lecture/ Small group discussion	1		Medicine, Surgery, Pediatrics,

Serial No.	Competency Nos.	Topics & Subtopics	Suggested Teaching Method	Hours	Vertical Integration	Horizontal Integration
		Diseases				
D	**D.** Clinical Postings(hours): 2 weeks (3hours /day x 12 days Monday to Saturday. **In institutes where radiotherapy facility is available 6 hours will be allotted to Radiotherapy department. Time Table in these institutes will be prepared by Radio Diagnosis and Radiotherapy department in joint collaboration**					
CP 1	RD1.1 RD1.2	Introduction to All modalities under Radiodiagnosis and Radiation Protection.	Lecture, Demonstration, Small group teaching	**1**		
CP 2	RD1.5	Role of Radiology in Chest Conditions lungs and heart	Lecture, Demonstration, Small group teaching			Medicine and Pediatrics
CP 3	RD1.6	Role of Radiology in Abdominal Conditions hepatobilary system and Gastrointestinal System	Lecture, Demonstration, Small group teaching	3		Surgery
CP 4	RD1.6	Role of Radiology in Abdominal Conditions - Genitourinary system	Lecture, Demonstration, Small group teaching	3		Surgery
CP 5	RD1.4 & RD 1.5	Role of Radiology in Obstetrics and Gynaecolgy	Demonstration, Small group teaching	3		Obstetrics & Gynecology
CP 6	RD1.6	Role of	Demonstration,	3		Orthopedics

Serial No.	Competency Nos.	Topics & Subtopics	Suggested Teaching Method	Hours	Vertical Integration	Horizontal Integration
		Radiology in Musculoskeletal system	Small group teaching			
CP 7	RD1.6	Role of Radiology in Diseases of Central Nervous System	Demonstration, Small group teaching	3		All clinical Branches
CP 8	RD1.2	Basic Principles of Computed Tomography	Demonstration, Small group teaching	**3**		
CP 9	RD1.2	Basic Principles of Magnetic Resonance Imaging	Demonstration, Small group teaching	**3**		
CP 10	RD1.1	Radiation Hazards and Radiation Protection	Demonstration, Small group teaching	3		
CP 11	RT	Radiotherapy related topics	Radiotherapy related topics	3		
CP 12	RT	Radiotherapy related topics	Radiotherapy related topics	3		

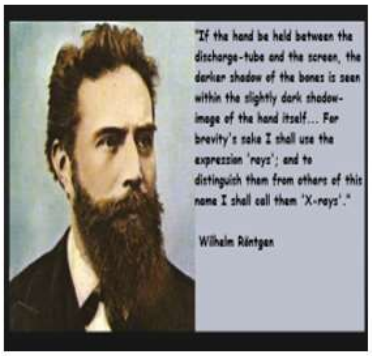
Learning Resource Material

Sr.no.	Author	Title of book/ Material	Publisher
1	David Sutton	Text Book of Radiology and Medical Imaging for Medical Students Seventh Edition	Elseivier
2	David Sutton	Text Book of Radiology & Imaging Students Seventh Edition	Elseivier
3	Grainger Allison	Diagnostic Radiology	Elseivier

Name of the Institute

LOG BOOK

DEPARTMENT OF RADIODIAGNOSIS



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4	LIST OF COMPETENCIES	08
5	PHASE III/I	10

RADIODIAGNOSIS LOGBOOK CERTIFICATE

This is to certify that this logbook is the bonafide record of Mr. / Ms..... Roll No…….. Admission Year ……., of the Department of RadioDiagnosis at …… ……. Medical College.

The logbook is as per the guidelines of Competency Based Undergraduate Medical Education Curriculum, Graduate Medical Regulation 2019.

He / She has satisfactorily attended/ completed all assignments mentioned in this logbook as per the guidelines prescribed by National Medical Commission.

Head of Department
Department of Radio Diagnosis
Signature with Date

INTERNAL ASSESSMENT EXAMINATION IN RADIODIAGNOSIS

Please refer General Surgery Syllabus (available on https://www.muhs.ac.in/upload/syllabus/Third%20MBBS%20General%20Surgery%20Syllabus%20030621.pdf) for details internal assessment in radio diagnosis.

Format / Skeleton of question paper for University

Please refer General Surgery Syllabus (available on https://www.muhs.ac.in/upload/syllabus/Third%20MBBS%20General%20Surgery%20Syllabus%20030621.pdf) for details question paper for university in radio diagnosis.

Self-Directed Learning: Seminars, Tutorials, Projects, Quizzes,

Extra-curricular activities

Sr. No.	Self- directed learning (Seminars, Tutorials, Projects, Quizzes, Extracurricular activities)	Date	Phase III/I	Signature of Teacher
1				
2				

Reflection (minimum 200 words) –1
Date:

TOPIC:

LOGBOOK CLINICAL SKILLS : LIST OF COMPETENCIES

Clinical skills can be assessed by case presentation, case-based discussion, objective structured clinical assessment the checklist, MiniCex, as per the institutional preference.

Sr. No	Competencies Addressed	Name of the Activity
1	PE21.12	How will you interpret a KUB Report?
2	PE23.13	How will you report a Chest radiograph and rule out cardiomegaly?
3	PE23.16	How will you use the ECHO reports in management of case of Cardiac disease ?
4	PE30.23	How will you interpret CT scan and MRI Report?

Radiotherapy

For theory Competencies to be included in Surgery & Radiology Syllabus

Clinical Postings-3 days where ever department exists

ANNEXURE 6

COURSE CONTENT

(Total teaching hours for Otorhinolaryngology = 25+40+5 = 70)

Lectures:

MBBS phase III-

Total Teaching hours: 25 hours

S. NO	TOPICS	COMPETENCIES	SUBTOPICS	AIT	HOURS
1.	Anatomy and Physiology of ear, nose, throat, head & neck				
			Lecture: 1		1
		EN 1.1 AN40.1 AN40.2 AN40.3	Describe the Anatomy & physiology of ear Describe & identify the parts, blood supply and nerve supply of external ear Describe & demonstrate the boundaries, contents, relations and functional anatomy of middle ear and auditory tube Describe the features of internal ear	Anatomy	
			Lecture: 2		1
		EN 1.1 AN37.1 AN37.2 AN37.3	Describe the Anatomy & physiology of Nose, Throat Describe & demonstrate features of nasal septum, lateral wall of nose, their blood supply and nerve supply Describe location and functional anatomy of paranasal sinuses Describe the morphology, identify structure of the wall, nerve supply, blood supply and actions of intrinsic and extrinsic muscles of the larynx	Anatomy Physiology	
		PY10.13	Describe and discuss perception of smell and taste sensation		
			Lecture: 3		1
		EN 1.1 EN 1.2	Describe the Anatomy & physiology of Head and Neck Describe the pathophysiology of common diseases in Head and Neck	Anatomy	
2.	Clinical Skills				
			Lecture: 4		1
		EN 2.11 EN 2.15	Describe and identify by clinical examination malignant & pre- malignant ENT diseases Describe the national programs for prevention of deafness, cancer, noise & environmental pollution	Community Medicine	
3.	Management of diseases of ear, nose & throat				
			Lecture: 5		1
		EN4.1 EN4.6 EN4.2	Elicit document and present a correct history, demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of Otalgia Elicit document and present a correct history, demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of Discharging ear Elicit document and present a correct history, demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of diseases of the external Ear		

			Lecture: 6		1
		EN4.3 PE28.4 EN4.5	Elicit document and present a correct history, demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of ASOM Discuss the etio-pathogenesis, clinical features and management of Acute Otitis Media (AOM) Elicit document and present a correct history, demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of OME	Paediatrics	
			Lecture: 7		1
		EN4.6 EN4.7	Elicit document and present a correct history demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of CSOM Elicit document and present a correct history, demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of squamosal type of CSOM		
			Lecture: 8		1
		EN4.12 EN4.12 EN4.15	Elicit document and present a correct history demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of Hearing loss Describe the clinical features, investigations and management principles of Sudden Sensori-neural Hearing Loss Describe the clinical features, investigations management principles of Noise Induced Hearing Loss		
			Lecture: 9		1
		EN4.18	Describe the clinical features, investigations and principles management of Facial Nerve palsy		

			Lecture: 10		1
		EN4.19 EN4.13 EN4.21 EN4.14	Describe the clinical features, investigations and principles of management of Vertigo Describe the clinical features, investigations and principles of management of Otosclerosis Describe the clinical features, investigations and principles of management of Tinnitus Describe the clinical features, investigations and management of Sudden Sensorineural Hearing Loss		
			Lecture: 11		1
		EN4.23 EN4.25	Describe the clinical features, investigations and principles of management of DNS Elicit document and present a correct history, demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of type of Nasal Polyps		
			Lecture: 12		1
		EN4.27 EN4.28 EN4.29 PE31.1	Elicit document and present a correct history, demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of Allergic Rhinitis Elicit document and present a correct history, demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of Vasomotor Rhinitis Elicit, document and present a correct history, demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of Acute & Chronic Rhinitis Describe the etio-pathogenesis, management and prevention of Allergic Rhinitis in Children	Paediatrics	

			Lecture: 13		1
		EN4.30 EN4.31 EN4.32	Elicit document and present a correct history, demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of Epistaxis Describe the clinical features, investigations and principles of management of trauma to the face & neck Describe the clinical features, investigations and principles of management of nasopharyngeal Angiofibroma		
			Lecture: 14		1
		EN4.33	Elicit document and present a correct history demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of type of Acute & Chronic Sinusitis		
			Lecture: 15		1
		EN4.34 EN4.35	Describe the clinical features, investigations and principles of management of Tumors of Maxilla Describe the clinical features, investigations and principles of management of Tumors of Nasopharynx		
			Lecture: 16		1
		EN4.36 EN4.37 EN4.41 EN4.38	Describe the clinical features, investigations and principles of management of diseases of the Salivary glands Describe the clinical features, investigations and principles of management of Ludwig's angina Describe the clinical features, investigations and principles of management of Acute & chronic abscesses in relation to Pharynx Elicit document and present a correct history demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of type of dysphagia		

			Lecture: 17		1
		EN4.39 PE28.1 PE28.2 PE28.3	Elicit document and present a correct history, demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of Acute & Chronic Tonsillitis Discuss the etio-pathogenesis, clinical features and management of Naso pharyngitis Discuss the etio-pathogenesis of Pharyngo Tonsillitis Discuss the clinical features and management of Pharyngo Tonsillitis	Paediatrics	
			Lecture: 18		1
		EN4.43 EN4.44 EN4.45 AN38.3	Describe the clinical features, investigations and principles of management of Acute & Chronic Laryngitis Describe the clinical features, investigations and principles of management of Benign lesions of the vocal cord Describe the clinical features, investigations and principles of management of Vocal cord palsy Describe anatomical basis of recurrent laryngeal nerve injury	Anatomy	
			Lecture: 19		1
		EN4.46 EN4.47	Describe the clinical features, investigations and principles of management of Malignancy of the Larynx & Hypopharynx Describe the clinical features, investigations and principles of management of Stridor		
			Lecture: 20		
		DE4.1 DE4.2	Discuss the prevalence of oral cancer and enumerate the common types of cancer that can affect tissues of the oral cavity Discuss the role of etiological factors in the formation of precancerous /cancerous lesions	Pathology	

		EN4.52	Describe the Clinical features, Investigations and principles of management of diseases of Oesophagus		
			Lecture: 21		1
		EN4.53 EN3.6	Describe the clinical features, investigations and principles of management of HIV manifestations of the ENT Observe and describe the indications for and steps involved in the skills of emergency procedures in ear, nose & throat		
			Lecture: 22		1
			Revision lecture		
			Lecture: 23		1
			Revision lecture		
			Lecture: 24		1
			Revision lecture		
			Lecture: 25		1
			Revision lecture		

Small group discussions

MBBS phase III/I-

Total Teaching hours: 40 hours

SR. NO.	TOPICS	COMPETENCIES	SUBTOPICS	AIT	HOURS
	Anatomy and Physiology of ear, nose, throat, head & neck				
1.		AN40.1	Describe & identify the parts, blood supply and nerve supply of external ear		0.5 hour
2.		AN40.2	Describe & demonstrate the boundaries, contents, relations and functional anatomy of middle ear and auditory tube		1 hour
3.		AN37.1	Describe & demonstrate features of nasal septum, lateral wall of nose, their blood supply and nerve supply		1 hour
4.		AN38.1	Describe the morphology, identify structure of the wall, nerve supply, blood supply and actions of intrinsic and extrinsic muscles of the larynx		0.5 hour
5.		PY10.15	Describe and discuss functional anatomy of ear and auditory pathways & physiology of hearing		1 hour
6.		PY10.16	Describe and discuss pathophysiology of deafness. Describe hearing tests		0.5 hour
	General Medicine				
7.		IM24.17	Describe and discuss the aetiopathogenesis, clinical presentation, identification, functional changes, acute care, stabilization, management and rehabilitation of hearing loss in the elderly		1.5 Hours
	Paediatrics				
8.		PE28.5	Discuss the etio-pathogenesis, clinical features and management of Epiglottitis		0.5 hour
9.		PE28.6	Discuss the etio-pathogenesis, clinical features and management of Acute laryngo-tracheo-bronchitis		0.5 hour

10.		PE28.7	Discuss the etiology, clinical features and management of Stridor in children		1 hour
11.		PE28.8	Discuss the types, clinical presentation, and management of foreign body aspiration in infants and children		1 hour
	Clinical Skills				
12.		EN 2.9	Choose correctly and interpret radiological, microbiological & histological investigations relevant to the ENT disorders X Rays of mastoid, PNS, nasopharynx, neck, thorax -Routine blood investigations, Pus-bacterial culture, sensitivity, Fungal culture and KOH mount -FNAC and biopsy		1 hour 1 hour 1 hour
13.		EN2.15	Describe the national programs for prevention of deafness, cancer, noise & environmental pollution		1.5 hour
	Management of diseases of ear, nose & throat				
14.		EN4.1	Elicit document and present a correct history, demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of Otalgia		1 hour
15.		EN4.3	Elicit document and present a correct history, demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of ASOM		1.5 hour
16.		EN4.7	Elicit document and present a correct history demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of CSOM		1.5 hours
17.		EN4.12	Elicit document and present a correct history demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of Hearing loss		1.5 hour
18.		EN4.13	Describe the clinical features, investigations and principle of management of Otosclerosis		1 hour
19.		EN 4.14	Describe the clinical features, investigations and principle of management of Sudden Sensorineural Hearing Loss		1 hour

20.		EN4.15	Describe the clinical features, investigations and principle of management of Noise Induced Hearing Loss		0.5 hour
21.		EN 4.18	Describe the clinical features, investigations and principle of management of Facial Nerve palsy		1 hour
22.		EN 4.19	Describe the clinical features, investigations and principle of management of Vertigo		0.5 hour
23.		EN 4.18	Describe the clinical features, investigations and principle of management of Tinnitus		0.5 hour
24.		EN4.27	Elicit document and present a correct history, demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of Allergic Rhinitis		1 hour
25.		EN4.29	Elicit, document and present a correct history, demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of Acute & Chronic Rhinitis		1.5 hours
26.		EN 4.30	Elicit document and present a correct history demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of epistaxis		1 hour
27.		EN4.33	Elicit document and present a correct history demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of Acute & Chronic Sinusitis		2 hours
28.		EN4.39	Elicit document and present a correct history, demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of Acute & Chronic Tonsillitis		1.5 hours
29.		EN 3.5 EN 4.10 EN 4.11	Observe and describe the indications for and the steps involved in the surgical procedures in ear, nose and throat		3 hours
30.		EN4.42	Elicit, document and present a correct history, demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of hoarseness of voice		1.5 hours
31.		EN4.47	Describe the clinical features, investigations and principles of management of Stridor		1 hour
32.		EN4.49	Elicit document and present a correct history, demonstrate and describe the clinical features, choose the correct investigations and describe the principles of		1.5 hours

			management of foreign bodies in the air & food passages		
33.		EN4.53	Describe the clinical features, investigations and principles of management of HIV manifestations of the ENT		1 hour
	Community Medicine				
34.		CM3.1	Describe the health hazards of air, water, noise, radiation and pollution		1.5 hours

Self Directed Learning

MBBS phase III/I -

Total Teaching hours: 5 hours

Sr. No.	Competencies	SUBTOPICS	AIT	TL Methods	HOURS
1.	EN1.1	Anatomy and blood supply of Tonsil		Quiz-Poster Presentation (on topic given in groups)	5 hours
2.	EN1.2	Clinical features, diagnosis and treatment of: ASOM			
3.	EN2.4	Tuning Fork Tests			
4.	EN 3.5	Complications of tonsillectomy			
5.	EN 4.24	Septoplasty –Technique, Procedure and Complications			
6.	EN 4.5	Clinical features and management Otitis media with effusion, Myringotomy			
7.	EN 4.50	Indications and Complications of Tracheostomy			

Subject:
Otorhinolaryngology
Lectures

MBBS phase III-

Total Teaching hours: 25 hours

S. NO	TOPICS	COMPETENCIES	SUBTOPICS	AIT	HOURS
1.	**Anatomy and Physiology of ear, nose, throat, head & neck**				
			Lecture: 1		1
		EN 1.1 AN40.1 AN40.2 AN40.3	Describe the Anatomy & physiology of ear Describe & identify the parts, blood supply and nerve supply of external ear Describe & demonstrate the boundaries, contents, relations and functional anatomy of middle ear and auditory tube Describe the features of internal ear	Anatomy	
			Lecture: 2		1
		EN 1.1 AN37.1 AN37.2 AN37.3	Describe the Anatomy & physiology of Nose, Throat Describe & demonstrate features of nasal septum, lateral wall of nose, their blood supply and nerve supply Describe location and functional anatomy of paranasal sinuses Describe the morphology, identify structure of the wall, nerve supply, blood supply and actions of intrinsic and extrinsic muscles of the larynx	Anatomy Physiology	

		PY10.13	Describe and discuss perception of smell and taste sensation		
			Lecture: 3		1
		EN 1.1 EN 1.2	Describe the Anatomy & physiology of Head and Neck Describe the pathophysiology of common diseases in Head and Neck	Anatomy	
2.	**Clinical Skills**				
			Lecture: 4		1
		EN 2.11 EN 2.15	Describe and identify by clinical examination malignant & pre- malignant ENT diseases Describe the national programs for prevention of deafness, cancer, noise & environmental pollution	Community Medicine	
3.	**Management of diseases of ear, nose & throat**				
			Lecture: 5		1
		EN4.1 EN4.6 EN4.2	Elicit document and present a correct history, demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of Otalgia Elicit document and present a correct history, demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of Discharging ear Elicit document and present a correct history, demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of diseases of the external Ear		

			Lecture: 6		1
		EN4.3 PE28.4 EN4.5	Elicit document and present a correct history, demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of ASOM Discuss the etio-pathogenesis, clinical features and management of Acute Otitis Media (AOM) Elicit document and present a correct history, demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of OME	Paediatrics	
			Lecture: 7		1
		EN4.6 EN4.7	Elicit document and present a correct history demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of CSOM Elicit document and present a correct history, demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of squamosal type of CSOM		
			Lecture: 8		1
		EN4.12 EN4.12 EN4.15	Elicit document and present a correct history demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of Hearing loss Describe the clinical features, investigations and management principles of Sudden Sensori-neural Hearing Loss Describe the clinical features, investigations management principles of Noise Induced Hearing Loss		
			Lecture: 9		1
		EN4.18	Describe the clinical features, investigations and principles management of Facial Nerve palsy		

			Lecture: 10		1
		EN4.19 EN4.13 EN4.21 EN4.14	Describe the clinical features, investigations and principles of management of Vertigo Describe the clinical features, investigations and principles of management of Otosclerosis Describe the clinical features, investigations and principles of management of Tinnitus Describe the clinical features, investigations and management of Sudden Sensorineural Hearing Loss		
			Lecture: 11		1
		EN4.23 EN4.25	Describe the clinical features, investigations and principles of management of DNS Elicit document and present a correct history, demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of type of Nasal Polyps		
			Lecture: 12		1
		EN4.27 EN4.28 EN4.29 PE31.1	Elicit document and present a correct history, demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of Allergic Rhinitis Elicit document and present a correct history, demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of Vasomotor Rhinitis Elicit, document and present a correct history, demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of Acute & Chronic Rhinitis Describe the etio-pathogenesis, management and prevention of Allergic Rhinitis in Children	Paediatrics	

			Lecture: 13		1
		EN4.30 EN4.31 EN4.32	Elicit document and present a correct history, demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of Epistaxis Describe the clinical features, investigations and principles of management of trauma to the face & neck Describe the clinical features, investigations and principles of management of nasopharyngeal Angiofibroma		
			Lecture: 14		1
		EN4.33	Elicit document and present a correct history demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of type of Acute & Chronic Sinusitis		
			Lecture: 15		1
		EN4.34 EN4.35	Describe the clinical features, investigations and principles of management of Tumors of Maxilla Describe the clinical features, investigations and principles of management of Tumors of Nasopharynx		
			Lecture: 16		1
		EN4.36 EN4.37 EN4.41 EN4.38	Describe the clinical features, investigations and principles of management of diseases of the Salivary glands Describe the clinical features, investigations and principles of management of Ludwig's angina Describe the clinical features, investigations and principles of management of Acute & chronic abscesses in relation to Pharynx Elicit document and present a correct history demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of type of dysphagia		

			Lecture: 17		1
		EN4.39 PE28.1 PE28.2 PE28.3	Elicit document and present a correct history, demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of Acute & Chronic Tonsillitis Discuss the etio-pathogenesis, clinical features and management of Naso pharyngitis Discuss the etio-pathogenesis of Pharyngo Tonsillitis Discuss the clinical features and management of Pharyngo Tonsillitis	Paediatrics	
			Lecture: 18		1
		EN4.43 EN4.44 EN4.45 AN38.3	Describe the clinical features, investigations and principles of management of Acute & Chronic Laryngitis Describe the clinical features, investigations and principles of management of Benign lesions of the vocal cord Describe the clinical features, investigations and principles of management of Vocal cord palsy Describe anatomical basis of recurrent laryngeal nerve injury	Anatomy	
			Lecture: 19		1
		EN4.46 EN4.47	Describe the clinical features, investigations and principles of management of Malignancy of the Larynx & Hypopharynx Describe the clinical features, investigations and principles of management of Stridor		
			Lecture: 20		
		DE4.1 DE4.2	Discuss the prevalence of oral cancer and enumerate the common types of cancer that can affect tissues of the oral cavity Discuss the role of etiological factors in the formation of precancerous /cancerous lesions	Pathology	

		EN4.52	Describe the Clinical features, Investigations and principles of management of diseases of Oesophagus		
			Lecture: 21		1
		EN4.53 EN3.6	Describe the clinical features, investigations and principles of management of HIV manifestations of the ENT Observe and describe the indications for and steps involved in the skills of emergency procedures in ear, nose & throat		
			Lecture: 22		1
			Revision lecture		
			Lecture: 23		1
			Revision lecture		
			Lecture: 24		1
			Revision lecture		
			Lecture: 25		1
			Revision lecture		

Internal Assessment

Subject – Otorhinolaryngology

Applicable w.e.f batches admitted from 2019 and onwards

Phase		
	Theory	Practical
Second MBBS	-	EOP Practical Examination may be conducted. However, these marks shall not be added to the Internal Assessment.

3rd Year (III MBBS, PART I)						
Phase	**I-Exam (March)**			**II-Exam Prelim (August)**		
	Theory	Practical	Total Marks	Theory	Practical	Total Marks
III/I MBBS	50	50	100	100	100	200

Assessment in CBME is ONGOING PRCESS,

No Preparatory leave is permitted.

1. There shall be 2 internal assessment examinations in Otorhinolaryngology including Prelim.

2. The suggested pattern of question paper for internal assessment internal examinations, except prelim examination is attached at the end. Pattern of the prelims examinations should be similar to the University examinations.

3. Internal assessment marks for theory and practical will be converted to out of 25 (theory) + 25 (practical). Internal assessment marks, after conversion, should be submitted to university within the stipulated time as per directives from the University. **Conversion Formula for calculation of marks in internal assessment examinations.**

	Theory	Practical
Phase II	**-**	**-**
Phase III/I	**150**	**150**
Total	**150**	**150**
Conversion out of	**25**	**25**
Conversion formula	**Total marks in 2 IA theory examinations /6**	**Total marks in 2 IA Practical examinations /6**
Eligibility criteria after conversion	**10**	**10**
	Combined theory + Practical = 25	

1. While preparing Final Marks of Internal Assessment, the rounding-off marks shall done as illustrated in following table.

Total Internal Assessment Marks	Final rounded marks
13.01 to 13.49	13
13.50 to 13.99	14

2. Students must secure at least 50% marks of the total marks (combined in theory and practical / clinical; not less than 40 % marks in theory and practical separately) assigned for internal assessment in order to be eligible for appearing at the final University examination of that subject.
3. Internal assessment marks will not to be added to marks of the University examinations and will be shown separately in mark list.

4. Remedial measures

A. Remedial measures for non-eligible students

i) At the end of each internal assessment examination, students securing less than 50% marks shall be identified. Such students should be counseled at the earliest and periodically. Extra classes for such students may be arranged.

ii) If majority of the students found to be weak in a particular area then extra classes must be scheduled for all such students. Even after these measures, if a student is failed to secure 50% marks combined in theory and practical (40% separately in theory and practical) after prelim examination, the student shall not be eligible for final examination.

iii) Non eligible candidates are offered to reappear for repeat internal assessment examination/s, which must be conducted 2 months before next University examination. The pattern for this repeat internal assessment examination shall be similar to the final University examination. The marks in this examination shall be considered for deciding the eligibility criteria. Following conversion formula shall be used for converting the marks.

	Theory	**Practical**
Remedial examination	**100**	**100**
Conversion out of	**25**	**25**
Conversion formula	**Marks in remedial theory examinations /4**	**Marks in remedial Practical examinations /4**
Eligibility criteria after conversion	**10**	**10**
	Combined theory + Practical = 25	

B. <u>Remedial measures for absent students:</u>

If any of the students is absent for any of the 2 IA examinations due to any reasons, following measures shall be taken.

i. The student is asked to apply to the academic committee of the college for reexamination, through HOD, to ascertain the genuineness of the reason for absentee.

ii. If permitted by academic committee, an additional examination for such students is to be conducted after prelims examination. Marks for such additional examination shall be equal to the missed examination.

iii. Even if a student has missed more than one IA examination, he/she can appear for only one additional IA examination. In such scenario, eligibility should be determined by marks obtained in internal assessment examinations for which the candidate has appeared, without changing the denominator.

Format for Practical Examinations

Otorhinolaryngology

Internal Assessment Practical

Seat No.				Table viva				Practical Total
	Case	OSCE 1	OSCE 2	Surgical Pathology Radiology	Instruments and Surgical Procedure	Journal	Log Book	
Max. Marks	20	5	5	5	5	5	5	50

OSCE stations checklists to be prepared so as to give more weightage to crucial steps, if skills are small two or more skills may be included in same station

OSCE stations to include any of these – Clinical skills (case/audiology), Certifiable skils, AETCOM skills

Prelims Practical

Subject: Otorhinolaryngology Practical									
Seat No.						Table Viva			Practical Total
	Case	OSCE 1 (Clinical skills)	OSCE 2 (Clinical skills)	OSCE 3 (Certifiable skills)	OSCE 4 (AETCOM skills)	Surgical Pathology Radiology	Instruments and Surgical Procedure	Journal &log book	
Max. Marks	30	10	10	10	10	10	10	10	100

MUHS Final Practical

Subject: Otorhinolaryngology Practical								
Seat No.						**Table Viva**		**Practical Total**
	Case	**OSCE 1 (Clinical skills)**	**OSCE 2 (Clinical skills)**	**OSCE 3 (Certifiable skills)**	**OSCE 4 (AETCOM skills)**	**Surgical Pathology Radiology**	**Instruments and Surgical Procedure**	
Max. Marks	**30**	**10**	**10**	**10**	**10**	**15**	**15**	**100**

Internal Assessment Theory Examination (I)

Otorhinolaryngology

Instructions:

SECTION "A" MCQ

1) *Put ☒ in the appropriate box below the question number once only.*
2) *Use blue ball point pen only.*
3) *Each question carries **One mark.***
4) *Students will not be allotted mark if he/she overwrites strikes or put white ink on the cross once marked.*

SECTION "A" MCQ (10 Marks)

1. Multiple Choice Questions (Total 10 MCQ of One mark each) (1x10=10)

a) b) c) d) e) f) g) h) i) j)

Instructions:

1) *Use **blue/black** ball point pen only.*
2) ***Do not** write anything on the **blank portion of the question paper**. If written anything, such type of act will be considered as an attempt to resort to unfair means.*
3) ***All** questions are **compulsory**.*
4) *The number to the **right** indicates **full** marks.*
5) *Draw diagrams **wherever** necessary.*
6) *Use a common answer book for all sections.*

SECTION "B" (40 Marks)

2. Long Answer Questions structured clinical questions (15 x1=15)

a)

3.Short Answer Questions (Any 5 out of 6),(including 1 on AETCOM) (5 x 5=25)

a) b) c) d) e) f)

MUHS Final Theory Examination

Otorhinolaryngology

MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES, NASHIK

FORMAT / SKELETON OF QUESTION PAPER

SECTION "A" MCQ

Instructions:

5) Put ☒ in the appropriate box below the question number once only.
6) Use blue ball point pen only.
*7) Each question carries **One mark.***
8) Students will not be allotted mark if he/she overwrites strikes or put white ink on the cross once marked.

SECTION "A" MCQ (20 Marks)

1. Multiple Choice Questions (Total 20 MCQ of One mark each) (1x20=20)

a) b) c) d) e) f) g) h) i) j)

k) l) m) n) o) p) q) r) s) t)

SECTION "B" & "C"

Instructions:

*1) Use **blue/black** ball point pen only.*
*2) **Do not** write anything on the **blank portion of the question paper**. If written anything, such type of act will be considered as an attempt to resort to unfair means.*
*3) **All** questions are **compulsory**.*
*4) The number to the **right** indicates **full** marks.*
*5) Draw diagrams **wherever** necessary.*
6) Use a common answer book for all sections.

SECTION "B" (40 Marks)

2. Long Answer Questions (Any 2 out of 3) structured clinical questions (15 x 2=30)

a) b) c)

3.Short Answer Questions (All 3),(including 1 on AETCOM) (5 x 3=15)

a) b) c)

SECTION C (40 Marks)

4 Long answer questions (15x1=15)

a)

5 Short answer questions(any 4 out of 5) (Clinical Reasoning) (5x4=20)

a) b) c) d) e)

. Section wise distribution of topics for Prelim & MUHS Annual Examination

Year: **III-I MBBS** Subject: **_Otorhinolaryngology**

Paper	Section	Topics
1	A	MCQs on all topics of Otorhinolaryngology Basic Science (2), Otology (6), Rhinology (6), Head Neck Laryngology (6)
	B Basic Sciences, Recent Advances, Otology	Anatomy and Physiology of Ear, Nose, Throat & Head and Neck; Recent Advances; Audiology and Hearing loss; Vestibular System; Diseases of External Ear and Middle Ear; Eustachian Tube and its disorder; Cholesteatoma, Chronic Otitis media and Complications; Otosclerosis; Facial Nerve and its Disorder; Meniere's Disease; Tumours of External Ear, Middle Ear and Mastoid; Deaf Child & Rehabilitation of Hearing Impaired
	C Rhinology, Laryngology, Head and Neck	Diseases of External Nose; Nasal Septum and its diseases Acute and Chronic Rhinitis and Sinusitis and its complications; Allergic, Vasomotor Rhinitis and NARES; Nasal Polypi; Epistaxis; Facial Trauma; Granulomatous Diseases of Nose; Neoplasm of Nasal Cavity and PNS; Disorders and Tumours of Oral Cavity and Salivary Gland; Acute and Chronic Tonsilitis, Adenoiditis and Pharyngitis Head and Neck space infections; Tumours of Nasopharynx, Hypopharynx, Oropharynx and Pharyngeal Pouch; Snoring and Sleep Apnoea; Laryngotracheal Trauma; Acute and Chronic inflammation of Larynx; Congenital Lesions and Benign Tumours of Larynx; Laryngeal paralysis; Carcinoma Larynx; Stridor and Tracheostomy; Voice and Speech Disorder; Foreign Bodies in Air and Food passage; Disorders of Oesophagus and Dysphagia

Name of the Institute

OTORHINOLARYNGOLOGY LOGBOOK

Competency – based medical education (CBME) involves the attainment of observable abilities by the students in a time-dependent, learner-centered manner. The emphasis is on outcomes that are relevant to the daily practice of medicine rather than facts. The student gets opportunity to learn at his/her own pace, the ultimate aim being the successful attainment of competencies by all students irrespective of when they do that. Assessment are aligned to these competencies; therefore, the tools differ drastically from the traditional curriculum. While written assessment of cognitive components constitute the bulk of traditional curricular assessment

Competency-based curriculum strives to employ more of workplace-based assessment including direct observation and daily logs.

Sayings of the great:

"I will prepare and someday my chance will come."

Sir Abraham Lincoln

"Strength does not come from physical capacity, it comes from an indomitable will."

Mahatma Gandhi

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LOGBOOK CERTIFICATE

This is to certify that this logbook is the bonafide record of Mr. / Ms. ..... Roll No……..Admission Year ……, of the Department of Otorhinolaryngology (ENT) at ……..…….Medical College.

The logbook is as per the guidelines of Competency Based Undergraduate Medical Education Curriculum, Graduate Medical Regulation 2019.

He / She has satisfactorily attended/ completed all assignments mentioned in this logbook as per the guidelines prescribed by National Medical Commission.

_____

Head of Department of Otorhinolaryngology

Signature with Date

BIODATA OF THE CANDIDATE

PHOTO

Name of the student:

Name of the course: MBBS

Date of birth:

Father’s / Guardian’s name:

Mother’s name:

Blood group:

Permanent Address:

……

……..

Temporary Address:

……

…….

Student’s contact no:

Father’s/ Guardian’s contact no:

Student’s Email id:

Father’s/ Guardian’s Email id:

Candidates Signature: ……... Date: .....

GENERAL INSTRUCTIONS

1) The logbook is a record of the academic / non-academic activities of the student. Each Medical student is responsible for maintaining their logbook.

2) This logbook is prepared as per the guidelines of NMC for implementation of Competency Based Curriculum for 3rd Professional MBBS students in the subject of Otorhinolaryngology.

3) Students are instructed to keep their logbook entries up to date. It is the responsibility of the student to enter their activity in respective pages & get them duly signed by the supervising faculty.

4) Entries in the logbook will be in accordance with activities done in the department & have to be scrutinized by the Head of the department.

5) The logbook assessment will be based on multiple factors like

   - Overall presentation
   - Active participation in the sessions Quality of write up of reflections.
   - Timely completions
   - Attendance

6) The logbook shall be kept as record work of the candidate for the department & be submitted to department as a bonafide record of the candidate before appearing for the University examination.

NOTE:

1. A **clear record** of all components that add to the internal assessment marks needs to be maintained by the institution and retained by them for at least **2 years** after passing of the examination. Institutions may be asked to provide these details by the University as and when required.

The contents in the logbook are suggested guidelines. The institutions can make **necessary changes as per the needs.**

ATTENDANCE

Attendance requirements are **75% in theory and 80% in practical/clinical** for eligibility to appear for the examination in that subject. In subjects that are taught in more than one phase- the learner must have 75% attendance in theory and 80% in practical in each phase of instruction in that subject

Records of Examinations and Internal Assessment

Sr. No.	Exam No.	Date	Theory	Date	Practical (Exam 1 and 2 – 5 marks each for journal and logbook, Prelim exam-10 marks each for journal and logbook)	Feedback provided	Signature of student	Signature of teacher
1	Exam no.1- *Phase II (end of 1st clinical postings)		–		/40+10			
2	Exam no.2- Phase III/I (end of 2nd clinical postings)		/50		/40+10			
3	Preliminary Examination		/100		/80+20			
4	Total		/150		/150			
5	Conversion		/30		/30			
6	Final Internal Assessment Marks (to be submitted to University)		/30		/30			

***The practical examination conducted in phase II will be college level examination and marks of the same will not be included in the internal assessment.**

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Signature of Head of the Department

Self-Directed Learning, Seminars, Tutorials, Projects, Quizzes, extracurricular activities

Sr. No.	Self- directed learning (Seminars, Tutorials, Projects, Quizzes, Extracurricular activities)	Date	Phase II	Phase III/I	Signature of Teacher

Reflection (minimum 200 words) – 1

Date :

TOPIC:

Reflection (minimum 200 words) – 2 **Date :**

TOPIC:

LOGBOOK : LIST OF COMPETENCIES

Clinical skills can be assessed by case presentation, case-based discussion, objective structured clinical assessment the checklist, MiniCex, as per the institutional preference.

Competency # addressed	Name of Activity
Topic: Clinical Skills	
EN2.1	Elicit document and present an appropriate history in a patient presenting with an ENT complaint
EN2.2	Demonstrate the correct use of a headlamp and head mirror in the examination of the ear, nose and throat
EN2.4	Demonstrate the correct technique of performing and interpreting tuning fork tests
EN2.5	Demonstrate the correct technique of examination of the nose & paranasal sinuses including the use of nasal speculum
EN2.6	Demonstrate the correct technique of examining the throat including the use of a tongue depressor
EN2.7	Demonstrate the correct technique of examination of neck including elicitation of laryngeal crepitus
EN2.8	Demonstrate the correct technique to perform and interpret pure tone audiogram & impedance audiogram
EN2.12	Counsel and administer informed consent to patients and their families in a simulated environment
Topic: Management of diseases of ear, nose & throat	
EN4.1	Elicit document and present a correct history, demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of Otalgia
EN4.3	Elicit document and present a correct history, demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of ASOM
EN4.4	Demonstrate the correct technique to hold visualize and assess the mobility of the tympanic membrane and its mobility and interpret and diagrammatically represent the findings

EN4.7	Elicit document and present a correct history demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of mucosal type of CSOM
EN4.8	Elicit document and present a correct history, demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of squamosal type of CSOM
EN4.9	Demonstrate the correct technique for syringing wax from the ear in a simulated environment
EN4.22	Elicit document and present a correct history demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of Nasal Obstruction
EN4.26	Elicit document and present a correct history demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of Adenoid
EN4.27	Elicit document and present a correct history demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of Allergic Rhinitis
EN4.30	Elicit document and present a correct history demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of Epistaxis
EN4.37	Describe the clinical features, investigations and principles of management of Ludwig's angina
EN4.39	Elicit document and present a correct history demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of Chronic Tonsillitis
EN4.42	Elicit document and present a correct history demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of hoarseness of voice
EN4.49	Elicit document and present a correct history demonstrate and describe the clinical features, choose the correct investigations and describe the principles of management of foreign bodies in the air & food passages

LOGBOOK PSYCHOMOTOR / PERFORMANCE SKILLS:

Skills can be assessed by objective structured clinical assessment with checklist, Global Rating Scale, Simulated patients as per the institutional preference.

Colleges are instructed prepare modules for skill training as per NMC guidelines.

Module 5 Skill Training.

I - Otoscopy

D – Anterior nasal packing

LIST OF COMPETENCIES

Competency # addressed	**Name of Activity**
EN2.3	Demonstrate the correct technique of examination of the ear including Otoscopy
EN2.13	Identify, resuscitate and manage ENT emergencies in a simulated environment (including tracheostomy, anterior nasal packing, removal of foreign bodies in ear, nose, throat and upper respiratory tract)

LOGBOOK FOR AETCOM SKILLS

Counselling for Investigation, Treatment, Prognosis, Blood donation, Organ Donation, Breaking Bad news. All types of consent. Medicolegal aspects and Ethics, Empathy and professionalism as per the Phase of the MBBS. Include cases of Allied branches also.

Competency to be assessed during Clinical postings and /or small group discussions.

LIST OF COMPETENCIES FOR AETCOM

Competencies addressed

The student should be able to	Level
1. Identify, discuss and defend medico-legal, socio-cultural, professional and ethical issues as it pertains to the physician – patient relationship (including fiduciary duty)	KH
2. Identify and discuss physician's role and responsibility to society and the community that she/he serves	KH

PHASE II-clinical (minimum two assessments)

Sr. No.	Competency # addressed	Name of Activity	Site Ward, skill lab, opd , casualty,	Date completed	Attempt at activity First (F) Repeat (R) Remedial (Re)	Rating Below (B) expectations Meets (M) expectations Exceeds (E) expectations OR Numerical Score	Decision of faculty Completed (C) Repeat (R) Remedial (Re)	Initial of faculty	Feedback received Initial of Learner	Method of assessment and Score
1.										
2.										
3.										
4.										
5.										
6.										

PHASE II-Psychomotor

Sr. No.	Competency # addressed	Name of Activity	Site Ward, skill lab, opd , casualty,	Date completed	Attempt at activity First (F) Repeat (R) Remedial (Re)	Rating Below (B) expectations Meets (M) expectations Exceeds (E) expectations OR Numerical Score	Decision of faculty Completed (C) Repeat (R) Remedial (Re)	Initial of faculty	Feedback received Initial of Learner	Method of assessment and Score
1.										
2.										

PHASE III Part I -clinical (Minimum two assessments)

Sr. No.	Competency # addressed	Name of Activity	Site Ward, skill lab, opd , casualty,	Date completed	Attempt at activity First (F) Repeat (R) Remedial (Re)	Rating Below (B) expectations Meets (M) expectations Exceeds (E) expectations OR Numerical Score	Decision of faculty Completed (C) Repeat (R) Remedial (Re)	Initial of faculty	Feedback received Initial of Learner	Method of assessment and Score
1.										
2.										
3.										
4.										
5.										
6.										

PHASE III Part I-Psychomotor skill

Sr. No.	Competency # addressed	Name of Activity	Site Ward, skill lab, opd , casualty,	Date completed	Attempt at activity First (F) Repeat (R) Remedial (Re)	Rating Below (B) expectations Meets (M) expectations Exceeds (E) expectations OR Numerical Score	Decision of faculty Completed (C) Repeat (R) Remedial (Re)	Initial of faculty	Feedback received Initial of Learner	Method of assessment and Score
1.										
2.										

PHASE III Part I - AETCOM

Sr. No.	Competency # addressed	Name of Activity	Site Ward, skill lab, opd , casualty,	Date completed	Attempt at activity First (F) Repeat (R) Remedial (Re)	Rating Below (B) expectations Meets (M) expectations Exceeds (E) expectations OR Numerical Score	Decision of faculty Completed (C) Repeat (R) Remedial (Re)	Initial of faculty	Feedback received Initial of Learner	Method of assessment and Score
1.										
2.										
3.										

REFLECTION ON AETCOM MODULE For PHASE III/Is

Module 2.1 – History taking

Competency addressed	Level
Elicit document and present an appropriate history in a patient presenting with an ENT complaint	SH

Reflection (minimum 200 words) -1 Date:

Signature of Teacher-in-charge

REFLECTION ON AETCOM MODULE

Module 2.12 – Counseling and administering informed consent

Competency addressed	Level
Counsel and administer informed consent to patients and their families in a simulated environment	SH

Reflection (minimum 200 words)-2 Date:

Signature of Teacher-in-charge

ANNEXURE 1:

RECORDING FORM FOR MINI – CEX

EVALUATOR : DATE :

STUDENT :

YEAR :

PATIENT DIAGNOSIS :

SETTINGS : AMBULATORY NEW COMPLEXITY : LOW

IN PATIENT FOLLOW UP MODERATE

ED HIGH

OTHER :

PATIENT AGE PATIENT SEX

FOCUS : DATA GATHERING / DIAGNOSIS / THERAPY / COUNSELLING

1. **MEDICAL INTERVIEWING SKILLS** (OBSERVED / NOT OBSERVED)

1 2 3 / 4 5 6 / 7 8 9

2. **PHYSICAL INTERVIEWING SKILLS** (OBSERVED / NOT OBSERVED)

1 2 3 / 4 5 6 / 7 8 9

3. **HUMANISTIC QUALITIES** / PROFFESIONALISM (OBSERVED / NOT OBSERVED)

1 2 3 / 4 5 6 / 7 8 9

4. **CLINICAL JUDGEMENT** (OBSERVED / NOT OBSERVED)

1 2 3 / 4 5 6 / 7 8 9

5. **COUNSELLING SKILLS** (OBSERVED / NOT OBSERVED)

1 2 3 / 4 5 6 / 7 8 9

6. **ORGANIZATION / EFFICIENCY** (OBSERVED / NOT OBSERVED)

1 2 3 / 4 5 6 / 7 8 9

7. **OVERALL CLINICAL COMPETENCE** (OBSERVED / NOT OBSERVED)

1 2 3 / 4 5 6 / 7 8 9

MINI CEX TIME : OBSERVING : _____ MINS

PROVIDING FEEDBACK _____ MINS

UNSATISFACTORY 1,2,3

SATISFACTORY 4, 5, 6

SUPERIOR 7, 8, 9

EVALUATOR SATISFACTION WITH MINI CEX

LOW 1 2 3 4 4 5 6 7 8 9 HIGH

RESIDENT SATISFACTION WITH MINI CEX

LOW 1 2 3 4 4 5 6 7 8 9 HIGH

COMMENTS :

STUDENT SIGNATURE EVALUATOR SIGNATURE

ANNEXURE 2:

AetCom skills can be assessed by use of Kalamazoo consensus.

Criteria
Builds relationship
Opens the discussion
Gathers information
Understands the patient's perspective
Shares information
Manages flow
Overall rating
Signature of teacher

Communication skills rating scale adapted from Kalamazoo consensus statement.

Rating 1-3 - Poor, 4 -6 Satisfactory, 6 -10 Superior

Subject: General Surgery
Clinical Postings

Learner -Doctor Programme (clinical clerkship)

Phase II

- History taking
- General Examination
- Local Examination with demonstration of signs.
- Psychomotor Skills
- AETCOM of Phase II

Phase III/ I

- All of Phase II plus
- Psychomotor Skills
- Differential diagnosis
- Investigations
- AETCOM of Phase III Part I

Phase III/ II

- All of Phase III Part I plus
- Psychomotor Skills
- Management
- Counselling
- AETCOM Phase III/ Part II

-There shall be end post exam at the end of 1st, 2nd and 3rd clinical posting which will be added to internal assessment for practicals.
-At the end of 4th clinical posting of 4 weeks there will be only formative assessment.

Subject: General Surgery
Lectures

MBBS Phase II-
Total Teaching hours: 25 hours

S. NO	TOPICS	COMPETENCIES	SUBTOPICS	AIT	HOURS
			Lecture: 1		
1.	**Introductory Lecture**		Welcome History of surgery Introduction to surgery and allied subjects Teaching, Learning & Assessment -CBME		1
2.	**Metabolic Response to Injury**		**Lecture**: 2		
		SU 1.1			1
			Describe basic concepts of homeostasis, enumerate the metabolic changes in injury and their mediators.	Physiology and Biochemistry	
		SU 1.2	**Lecture**: 3		1
			Describe the factors that affect the metabolic responses to injury.	Biochemistry	
3.	**Shock**				
		SU 2.1	**Lecture**: 4		1
		PA6.3	Describe Pathophysiology of shock, types of shock and principles of resuscitation including fluid replacement and monitoring. Define and describe shock, its pathogenesis and its stages	Pathology and Physiology	
		SU 2.2	**Lecture**: 5		1
			Describe the clinical features of shock and its appropriate treatment		

4.	**Blood and blood components**				
		SU 3.1	**Lecture**: 6		1
		PA22.4	Describe the indications and appropriate use of blood and blood products and complications of blood transfusion. Enumerate blood components and describe their clinical uses	Pathology	
5.	**Burns**				
		SU 4.1	**Lecture**: 7		1
			Describe pathophysiology of burns. Describe clinical features, diagnose type and extent of burns.	Physiology	
		SU 4.2, 4.3	**Lecture**: 8		1
			Plan appropriate treatment of burns. Discuss medicolegal aspect in burns injuries.		
6.	**Wound healing and wound care**				
		SU 5.1	**Lecture**: 9		1
		PA5.1 PA4.1 PA4.2	Describe normal wound healing and factors affecting healing. Define and describe the process of repair and regeneration including wound healing and its types Define and describe the general features of acute and chronic inflammation including stimuli, vascular and cellular events Enumerate and describe the mediators of acute inflammation	Pathology	
		SU 5.3	**Lecture**: 10		1
			Differentiate the various types of wounds, plan and observe management of wounds.		
7.	**Surgical Infections**				
		SU 6.1	**Lecture**: 11		1
			Define and describe the etiology and pathogenesis of surgical infections	Microbiology	

		SU 6.1	**Lecture**: 12		1
			Define and describe the etiology and pathogenesis of surgical infections- HIV-AIDS, Hepatitis, Gas Gangrene etc.	Microbiology	
		SU 6.2	**Lecture**: 13		1
			Enumerate prophylactic and therapeutic antibiotics. Plan appropriate management.		
8.	**Investigations of a surgical patient**				
		SU 9.1	**Lecture**: 14		1
		PA8.1 PA8.2 MI7.1	Choose appropriate biochemical, microbiological, pathological, imaging investigations and interpret the investigative data in a surgical patient. Describe the diagnostic role of cytology and its application in clinical care. Describe the basis of exfoliative cytology including the technique, stains used Describe the etio-pathogenesis and discuss the laboratory diagnosis of infections of genitourinary system	Biochemistry, Microbiology and Pathology	
9.	**Nutrition and fluid therapy**				
		SU 12.1	**Lecture**:15		1
			Enumerate the causes and consequences of malnutrition in the surgical patient.	Physiology	
		SU 12.2	**Lecture**:16		1
			Describe and discuss the methods of estimation and replacement of the fluid and electrolyte requirements in the surgical patients.	Physiology	
		SU 12.3	**Lecture**:17		1

			Discuss the nutritional requirements of surgical patients, the methods of providing nutritional support and their complications.	Biochemistry	
10.	**Transplantation**				
		SU 13.1	**Lecture**: 18		1
			Describe the immunological basis of organ transplantation.	Microbiology	
		SU 13.2	**Lecture**: 19		1
			Discuss the principles of immunosuppressive therapy. Enumerate Indications, describe surgical principles, management of organ transplantation	Microbiology, Pharmacology	
11.	**Basic surgical skills**				
		SU 14.1	**Lecture**: 20		1
		MI1.4 MI1.5	Describe Aseptic techniques, sterilisation and disinfection. Classify and describe the different methods of sterilization and disinfection. Discuss the application of the different methods in the laboratory, in clinical and surgical practice Choose the most appropriate method of sterilization and disinfection to be used in specific situations in the laboratory, in clinical and surgical practice	Microbiology	
12.	**Biohazard disposal**				
		SU 15.1	**Lecture**: 21		1
		MI8.7	Describe classification of hospital waste and appropriate methods of disposal. Demonstrate Infection control practices and use of Personal Protective Equipment (PPE)	Microbiology	
13.	**Trauma**				
		SU 17.1	**Lecture**: 22		1
			Describe the principles of first aid.		
		SU 17.2	**Lecture**: 23		1

			Basic Life Support	Anaesthesiology	
14.	**Skin and Subcutaneous tissue**				
		SU 18.1, SU 18.2, 18.3	**Lecture**: 24		1
			Describe the pathogenesis, clinical features and management of various cutaneous and subcutaneous infections. Describe clinical examination of surgical patient including swelling and discuss investigations for diagnosis and treatment plan. Classify skin tumours. Differentiate different skin tumours and discuss their management.		
15.	**Vascular diseases**				
		SU27.1	**Lecture**: 25		1
			Describe the etiopathogenesis, clinical features, investigations and principles of treatment of occlusive arterial disease.		

MBBS Phase III- Part I
Total Teaching hours: 25 hours

S. NO	TOPICS	COMPETENCIES	SUBTOPICS	AIT	HOURS
1.	**Metabolic response to injury**				
		SU1.3	**Lecture**: 1		1
			Describe basic concepts of postoperative care.		
2.	**Surgical Audit and Research**				
		SU7.1.7.2	**Lecture**: 2		1
			Describe the planning and conduct of surgical audit Describe the principles and steps of clinical research in General Surgery	Community Medicine	
3.	**Ethics**				
		SU8.1, 8.2	**Lecture**: 3		1
		AS10.3	Describe the principles of Ethics as it pertains to General Surgery and demonstrate professionalism and empathy to the patient undergoing general surgery Describe the role of communication in patient safety	Forensic Medicine, AETCOM	
		SU9.2	**Lecture**: 4		1
			Biological basis for early detection of cancer and multidisciplinary approach in management of cancer		
4.	**Pre, intra and post-operative management**.				
		SU10.1	**Lecture**: 5		1
			Describe the principles of perioperative management of common	AETCOM	
			surgical procedures and Describe the steps and obtain informed consent in a simulated environment		

		IM5.13, IM15.9	Enumerate the indications for ultrasound and other imaging studies including MRCP and ERCP and describe the findings in liver disease. Choose and interpret diagnostic tests based on the clinical diagnosis including complete blood count, PT and PTT, stool examination, occult blood, liver function tests, H.pylori test.		
5.	**Anaesthesia and pain management**				
		SU11.1, 11.5	**Lecture**: 6		1
		AS3.1, AS5.6	Describe principles of Preoperative assessment. Describe principles of providing post-operative pain relief and management of chronic pain. Describe the principles of preoperative evaluation. Observe and describe the principles and steps/ techniques involved S in common blocks used in Surgery(including brachial plexus blocks)	Anaesthesiology	
		SU11.6	**Lecture**: 7		1
		AS3.2	Describe Principles of safe General Surgery Elicit, present and document an appropriate history including medication history in a patient undergoing Surgery as it pertains to a preoperative anaesthetic evaluation	Anaesthesiology	
6.	**Transplantation**				
		SU13.4	**Lecture**: 9		1
			Counsel patients and relatives on organ donation in a simulated Environment Enumerate the indications for hepatic transplantation	AETCOM	
7.	**Basic Surgical Skills**				
		SU14.2	**Lecture**: 10		1
			Describe Surgical approaches, incisions and the use of appropriate instruments in Surgery in general.		
		SU14.3	**Lecture**: 11		1
			Describe the materials and methods used for surgical wound closure and anastomosis (sutures, knots and needles)		

8.	**Trauma**				
		SU17.2	**Lecture**: 12		1
			Demonstrate the steps in Basic Life Support. Transport of injured patient in a simulated environment	Anaesthesiology	
9.	**Developmental anomalies of face, mouth and jaws**				
		SU19.1, 19.2	**Lecture**: 13		1
			Describe the etiology and classification of cleft lip and palate. Describe the Principles of reconstruction of cleft lip and palate.	Human Anatomy	
10.	**Oropharyngeal cancer**				
		SU20.1, SU20.2	**Lecture**: 14		1
			Describe etiopathogenesis of oral cancer symptoms and signs of oropharyngeal cancer. Enumerate the appropriate investigations and discuss the Principles of treatment and reconstructive flap	ENT	
		DE 4.1, DE 4.2, DE 4.3, DE 4.4	**Lecture**: 15		1
			Discuss the prevalence of oral cancer and enumerate the common types of cancer that can affect tissues of the oral cavity. Discuss the role of etiological factors in the formation of precancerous /cancerous lesions. Identify potential pre-cancerous /cancerous lesions. Counsel patients to risks of oral cancer with respect to tobacco, smoking, alcohol and other causative factors.		
11.	**Disorders of salivary glands**				
		SU21.1	**Lecture**: 16		1
		AN28.9 , AN34.1 ,	Describe surgical anatomy of the salivary glands, pathology clinical presentation of disorders of salivary glands Describe & demonstrate the parts, borders, surfaces, contents, relations and nerve supply of parotid gland with course of its duct		

			and surgical importance. Describe & demonstrate the morphology, relations and nerve supply		
		SU21.2	**Lecture**: 17		1
			Enumerate the appropriate investigations and describe the Principles of treatment of disorders of salivary glands		
12.	**Thyroid and Parathyroid Glands**				
		SU22.1, 22.2	**Lecture**: 18		1
		AN35.2 PA32.1, IM12.13, IM12.15	Describe the applied anatomy and physiology of thyroid. Describe the etiopathogenesis of thyroidal swellings. Describe the etiopathogenesis of thyroidal swellings. Describe & demonstrate location, parts, borders, surfaces, relations & blood supply of thyroid gland Enumerate, classify and describe the etiology, pathogenesis, pathology and iodine dependency of thyroid swellings, Describe the pharmacology, indications, adverse reaction, interactions of thyroxine and antithyroid drugs. Describe and discuss the indications of thionamide therapy, radio iodine therapy and Surgery in the management of thyrotoxicosis	Human Anatomy, Pathology	
		SU22.4	**Lecture**: 19		1
			Describe the clinical features, classification and principles of management of thyroid cancer		
		SU22.5	**Lecture**: 20		1
		IM22.2	Describe the applied anatomy of parathyroid. Describe and discuss the clinical features of hypo - and hyperparathyroidism and the principles of their management Describe the aetiology, clinical manifestations, diagnosis and clinical approach to primary hyperparathyroidism	Human Anatomy	
13.	**Adrenal Glands**				
		SU23.1, 23.2, 23.3	**Lecture**: 21		1

			Describe the applied anatomy of adrenal glands. Describe the etiology, clinical features and principles of management of disorders of adrenal gland. Describe the clinical features, principles of investigation and management of Adrenal tumours	Human Anatomy	
14.	**Breast**				
		SU25.1	**Lecture**: 22		1
		PA31.1	Describe applied anatomy and appropriate investigations for breast disease Classify and describe the types, etiology, pathogenesis, pathology and hormonal dependency of benign breast disease	Human Anatomy	
		SU25.2	**Lecture**: 23		1
		PA31.2	Describe the etiopathogenesis, clinical features and principles of management of benign breast disease including infections of the breast. Classify and describe the epidemiology, pathogenesis, classification, morphology, prognostic factors, hormonal dependency, staging and spread of carcinoma of the breast		
		SU 25.3	**Lecture**: 24		1
			Describe the etiopathogenesis, clinical features, Investigations and principles of treatment of benign and malignant tumours of breast.	Radiodiagnosis	
15.	**Vascular diseases**				
		SU 27.1	**Lecture**: 25		
		AN19.3, AN20.5 AN20.9	Describe the etiopathogenesis, clinical features, investigations and principles of treatment of occlusive arterial disease. Explain the concept of "Peripheral heart. Explain anatomical basis of varicose veins and deep vein thrombosis. Identify & demonstrate palpation of vessels (femoral, popliteal, dorsalis pedis, post tibial), Mid inguinal point, Surface projection of: femoral nerve, Saphenous opening, Sciatic, tibial, common peroneal & deep peroneal nerve, great and small saphenous veins		

MBBS Phase III- Part II
Total Teaching hours: 70 hours

S. NO	TOPICS	COMPETENCIES	SUBTOPICS	AIT	HOURS
1.	**Anaesthesia and Pain Management**				
		SU 11.2	**Lecture**: 1		1
		AS5.6	Enumerate the principles of general, regional and local anaesthesia. Observe and describe the principles and steps/ techniques involved in common blocks used in Surgery (including brachial plexus blocks)	Anaesthesiology	
		SU 11.4	**Lecture**: 2		1
			Enumerate the indications and principles of day care General Surgery.	Anaesthesiology	
		SU 16.1	**Lecture**: 3		1
			Minimal Invasive General Surgery: Describe indications, advantages and disadvantages of Minimally Invasive General Surgery.		
2.	**Trauma**				
		SU 17.4, 17.5, 17.6	**Lecture**: 4		1
			Describe pathophysiology, mechanism of head injuries. Describe clinical features for neurological assessment and GCS in head injuries. Choose appropriate investigations and discuss the principles of management of head injuries.		

		SU 17.7	**Lecture**: 5		1
			Describe the clinical features of soft tissue injuries. Choose appropriate investigations and discuss the principles of management.		
		SU 17.8, 17.9	**Lecture**: 6		1
			Describe pathophysiology of chest injuries. Describe the clinical features and principles of management of chest injuries.		
		SU17.3	**Lecture**: 7		1
			Describe pathophysiology of Abdominal injuries. Describe the clinical features and principles of management of Abdominal injuries.		
3.	**Pancreas**				
		SU 24.1	**Lecture**: 8		1
		AN55.2	Describe the clinical features, principles of investigation, prognosis and management of pancreatitis. Demonstrate the surface projections of: stomach, liver, fundus of gall bladder, spleen, duodenum, pancreas, ileocecal junction, kidneys & root of mesentery	Human Anatomy	
		SU 24.2	**Lecture**: 9		1
			Describe the clinical features, principles of investigation, prognosis and management of pancreatic endocrine tumours.		
		SU 24.3	**Lecture**: 10		1
			Describe the principles of investigation and management of pancreatic disorders including pancreatitis and endocrine tumours.		
4.	**Cardio-thoracic General Surgery- Chest- Heart and Lungs**				
		SU 26.1, 26.2	**Lecture**: 11		1

			Outline the role of surgery in the management of coronary heart disease, valvular heart diseases and congenital heart diseases, diseases of Thorax and Diaphragm		
		SU 26.3	**Lecture**: 12		1
			Describe the clinical features of mediastinal diseases and the principles of management.		
		SU 26.4	**Lecture**: 13		1
			Describe the etiology, pathogenesis, clinical features of tumors of the lung and the principles of management.		
5.	**Vascular Diseases**				
		SU 27.1	**Lecture**: 14		1
			Describe the etiopathogenesis, clinical features, investigations and principles of treatment of occlusive arterial disease.		
		SU 27.2, 27.3, 27.4	**Lecture**: 15		1
			Demonstrate the correct examination of the vascular system and enumerate and describe the investigation of vascular disease. Describe clinical features, investigations and principles of management of vasospastic disorders. Describe the types of gangrene and principles of amputation.		
		SU 27.5, 27.6	**Lecture**: 16		1
		AN20.5	Describe the applied anatomy of the venous system of lower limb. Explain anatomical basis of varicose veins and deep vein thrombosis	Human Anatomy	
		SU 27.7	**Lecture**: 17		1
			Describe pathophysiology, clinical features, Investigations and principles of management of lymph edema, lymphangitis and lymphomas. Explain the concept of lymphoedema and spread of tumors via lymphatics and venous system		
6.	**Abdomen**				

		SU 28.1	**Lecture**: 18		1
		AN44.4 AN44.5	Describe pathophysiology, clinical features, Investigations and principles of management of Hernias Describe & demonstrate extent, boundaries, contents of Inguinal canal including Hesselbach's triangle. Explain the anatomical basis of inguinal hernia.	Human Anatomy	
		SU 28.1	**Lecture**: 19		1
			Describe pathophysiology, clinical features, Investigations and principles of management of Hernias	Human Anatomy	
		SU 28.1	**Lecture**: 20		1
		AN44.6	Describe pathophysiology, clinical features, Investigations and principles of management of Hernias Describe & demonstrate attachments of muscles of anterior abdominal wall	Human Anatomy	
		SU 28.1	**Lecture**:21		1
		AN44.7	Describe pathophysiology, clinical features, Investigations and principles of management of Hernias Enumerate common Abdominal incisions	Human Anatomy	
		SU 28.3	**Lecture**: 22		1
		AN47.2 AN47.3 AN47.4	Describe causes, clinical features, complications and principles of management of peritonitis and omental pathologies Name & identify various peritoneal folds & pouches with its explanation. Explain anatomical basis of Ascites & Peritonitis Explain anatomical basis of Subphrenic abscess	Human Anatomy	
		SU 28.4	**Lecture**: 23		1
		AN47.4	Describe pathophysiology, clinical features, investigations and K principles of management of Intra-abdominal abscess, mesenteric cyst, and retroperitoneal tumors Explain anatomical basis of Subphrenic abscess		
		SU 28.5	**Lecture**: 24		1
		AN23.1	Describe the applied Anatomy and physiology of esophagus Describe & demonstrate the external appearance, relations, blood supply, nerve supply, lymphatic drainage and applied anatomy of	Human Anatomy, Physiology	

			oesophagus		
		SU 28.6	**Lecture**: 25		1
			Describe the clinical features, investigations and principles of management of benign and malignant disorders of esophagus		
		SU 28.7	**Lecture**: 26		1
		AN47.6 AN47.1	Describe the applied anatomy and physiology of stomach Explain the anatomical basis of Splenic notch, accessory spleens, Kehr's sign, different types of vagotomy, liver biopsy (site of needle puncture), referred pain in cholecystitis, Obstructive jaundice, referred pain around umbilicus, radiating pain of kidney to groin &Lymphatic spread in carcinoma stomach Describe & identify boundaries and recesses of Lesser & Greater sac	Human Anatomy	
		SU 28.8	**Lecture**: 27		1
			Describe and discuss the aetiology, the clinical features, investigations and principles of management of congenital hypertrophic pyloric stenosis, Peptic ulcer disease, Carcinoma stomach		
		SU 28.10	**Lecture**: 28		1
		   AN47.4 AN47.6	Describe the applied anatomy of liver. Describe the clinical features, Investigations and principles of management of liver abscess, hydatid disease, injuries and tumors of the liver Explain anatomical basis of Subphrenic abscess Liver biopsy (site of needle puncture), referred pain in cholecystitis, Obstructive jaundice	Human Anatomy	
		SU 28.10	**Lecture**: 29		1
			Describe the applied anatomy of liver. Describe the clinical features, Investigations and principles of management of liver abscess, hydatid disease, injuries and tumours of the liver	Human Anatomy	

		SU 28.10	**Lecture**: 30		1
		AN47.3	Describe the applied anatomy of liver. Describe the clinical features, Investigations and principles of management of liver abscess, hydatid disease, injuries and tumors of the liver Explain anatomical basis of Ascites & Peritonitis	Human Anatomy	
		SU 28.11	**Lecture**: 31		1
		AN47.6	Describe the applied anatomy of spleen. Describe the clinical features, investigations and principles of management of splenic injuries. Describe the post-splenectomy sepsis – prophylaxis Explain the anatomical basis of Splenic notch, accessory spleens, Kehr's sign	Human Anatomy	
		SU 28.12	**Lecture**: 32		1
		AN47.7	Describe the applied anatomy of biliary system. Describe the clinical features, investigations and principles of management of diseases of biliary system Mention the clinical importance of Calot's triangle	Human Anatomy	
		SU 28.12	**Lecture**: 33		1
			Describe the applied anatomy of biliary system. Describe the clinical features, investigations and principles of management of diseases of biliary system	Human Anatomy	
		SU 28.12	**Lecture**: 34		1
		AN47.10 AN47.11	Describe the applied anatomy of biliary system. Describe the clinical features, investigations and principles of management of diseases of biliary system Enumerate the sites of portosystemic anastomosis Explain the anatomic basis of hematemesis & caput medusae in portal hypertension	Human Anatomy	

		SU 28.13, 28.14	**Lecture**: 35		1
		AN52.6	Describe the applied anatomy of small and large intestine Describe the development and congenital anomalies of foregut, midgut & hindgut	Human Anatomy	
		SU 28.13, 28.14	**Lecture**: 36		1
			Describe the clinical features, investigations and principles of management of disorders of small and large intestine including neonatal obstruction and Short gut syndrome	Human Anatomy	
		SU 28.13, 28.14	**Lecture**: 37		1
			Describe the clinical features, investigations and principles of management of disorders of small and large intestine including neonatal obstruction and Short gut syndrome	Human Anatomy	
		SU 28.13, 28.14	**Lecture**: 38		1
			Describe the clinical features, investigations and principles of management of disorders of small and large intestine including neonatal obstruction and Short gut syndrome	Human Anatomy	
		SU 28.13, 28.14	**Lecture**: 39		1
			Describe the clinical features, investigations and principles of management of disorders of small and large intestine including neonatal obstruction and Short gut syndrome	Human Anatomy	
		SU 28.13, 28.14	**Lecture**: 40		1
			Describe the clinical features, investigations and principles of management of disorders of small and large intestine including neonatal obstruction and Short gut syndrome	Human Anatomy	
		SU 28.13, 28.14	**Lecture**: 41		1
			Describe the clinical features, investigations and principles of management of disorders of small and large intestine including neonatal obstruction and Short gut syndrome	Human Anatomy	
		SU 28.15	**Lecture**: 42		1

			Describe the clinical features, investigations and principles of management of diseases of Appendix including appendicitis and its complications.		
		SU 28.16	**Lecture**: 43		1
		AN49.4	Describe applied anatomy including congenital anomalies of the rectum and anal canal Describe & demonstrate boundaries, content & applied anatomy of Ischiorectal fossa	Human Anatomy	
		SU 28.16	**Lecture**: 44		1
		AN48.8	Describe applied anatomy including congenital anomalies of the rectum and anal canal Mention the structures palpable during vaginal & rectal examination	Human Anatomy	
		SU 28.17	**Lecture**: 45		1
			Describe the clinical features, investigations and principles of management of common anorectal diseases		
		SU 28.17	**Lecture**: 46		1
			Describe the clinical features, investigations and principles of management of common anorectal diseases		
7.	**Urinary System**				
		SU 29.1	**Lecture**: 47		1
			Describe the causes, investigations and principles of management of Hematuria		
		SU 29.2	**Lecture**: 48		1
		AN52.7	Describe the clinical features, investigations and principles of management of congenital anomalies of genitourinary system Describe the development of urinary system	Human Anatomy	
		SU 29.3	**Lecture**: 49		1
		MI7.1	Describe the Clinical features, Investigations and principles of management of urinary tract infections Describe the etio-pathogenesis and discuss the laboratory diagnosis of infections of genitourinary system	Microbiology	
		SU 29.4	**Lecture**: 50		1

			Describe the clinical features, investigations and principles of management of hydronephrosis		
		SU 29.5	**Lecture**: 51		1
			Describe the clinical features, investigations and principles of management of renal calculi		
		SU 29.5	**Lecture**: 52		1
			Describe the clinical features, investigations and principles of management of renal calculi		
		SU 29.6	**Lecture**: 53		1
			Describe the clinical features, investigations and principles of management of renal tumours		
		SU 29.7	**Lecture**: 54		1
			Describe the principles of management of acute and chronic retention of urine		
		SU 29.8	**Lecture**: 55		1
			Describe the clinical features, investigations and principles of management of bladder cancer		
		SU 29.9	**Lecture**: 56		1
		AN48.7	Describe the clinical features, investigations and principles of management of disorders of prostate Mention the lobes involved in benign prostatic hypertrophy & prostatic cancer	Human Anatomy	
		SU 29.10	**Lecture**: 57		1
			Describe clinical features, investigations and management of urethral strictures and urethral injuries		
8.	**Penis, Testis and scrotum**				
		SU 30.1	**Lecture**: 58		1
		AN46.5	Describe the clinical features, investigations and principles of management of phimosis, paraphimosis. Explain the anatomical basis of Phimosis & Circumcision	Human Anatomy	
		SU 30.1	**Lecture**: 59		1

			Describe the clinical features, investigations and principles of management of carcinoma penis.		
		SU 30.2, 30.3	**Lecture**: 60		1
		AN46.1	Describe the applied anatomy clinical features, investigations and principles of management of undescended testis. Describe the applied anatomy clinical features, investigations and principles of management of epidydimo-orchitis Describe & demonstrate coverings, internal structure, side determination, blood supply, nerve supply, lymphatic drainage & descent of testis with its applied anatomy	Human Anatomy	
		SU 30.4, 30.5	**Lecture**: 61		1
		AN46.4	Describe the applied anatomy clinical features, investigations and principles of management of varicocele and hydrocoele Explain the anatomical basis of varicocele	Human Anatomy	
		SU 30.6	**Lecture**: 62		1
			Describe classification, clinical features, investigations and principles of management of benign tumours of testis.		
		SU 30.6	**Lecture**: 63		1
			Describe classification, clinical features, investigations and principles of management of malignant tumours of testis.		
9.			**Lecture**: 64		1
			Revision **Lecture** 1		
10.			**Lecture**: 65		1
			Revision **Lecture** 2		
11.			**Lecture**: 66		1
			Revision **Lecture** 3		
12.			**Lecture**: 67		1
			Revision **Lecture** 4		
13.			**Lecture**: 68		1
			Revision **Lecture**5		

14.			**Lecture**: 69		1
			Revision **Lecture** 6		
15.			**Lecture**: 70		1
			Revision **Lecture** 7		

Subject: General Surgery
Self-Directed Learning

MBBS phase III/I
Total Teaching hours : 5 hours
***These are suggested topics which can be modified at institutional level**

Sr. No.	TOPICS	COMPETENCIES	SUBTOPICS	AIT	HOURS
1.	**Ethics**				
		SU8.1	SDL:1		3
			Describe the principles of Ethics as it pertains to General Surgery. Demonstrate Professionalism and empathy to the patient.		
2.	**Transplantation**				
		SU13.3	SDL:2		2
			Discuss the legal and ethical issues concerning organ donation. Counsel patients and relatives on organ donation in a simulated.		

MBBS phase III/II

Total Teaching hours : 15 hours

***These are suggested topics which can be modified at institutional level**

Sr. No	TOPICS	COMPETENCIES	SUBTOPICS	HOURS
1.	**Thyroid**			
		SU 22.2, SU 22.3, SU22.4	SDL:1	4
			Describe the etiopathogenesis of thyroidal swellings. Demonstrate and document the correct clinical examination of thyroid swellings and discus the differential diagnosis and their management. Describe the clinical features, classification and principles of management of thyroid cancer	
2.	**Breast**			
		SU 25.2, SU 25.3	SDL:2	4
			Describe the etiopathogenesis, clinical features and principles of management of benign breast disease including infections of the breast. Describe the etiopathogenesis, clinical features, Investigations and principles of treatment of benign and malignant tumours of breast.	
3.	**Oral malignancy**			
		SU 20.1, SU 20.2	SDL:3	3
			Describe etiopathogenesis of oral cancer symptoms and signs of oropharyngeal cancer. Enumerate the appropriate investigations and discuss the Principles of treatment.	
4.	**Communication skills – Role play**			
		AETCOM	SDL:4	4

Subject: General Surgery
Small Group Discussion

MBBS phase III/I -

Small group teachings/ Tutorials/ Integrated teaching/ Practical's: 35 hours

- Competencies written in red (horizontal) and green (vertical) are of alignment and integration.
- 25 % of allotted time of the third professional shall be utilised for integrated learning with pre- and para-clinical subjects and shall be assessed during the clinical subject's examination.
- This allotted time will be utilised as integrated teaching by para- clinical subjects with clinical subjects (as Applied Anatomy, Clinical Pathology, Clinical Pharmacology, Clinical Microbiology, Radio diagnosis, Instruments, Operative Surgery, Communication skills etc.).

S. NO	TOPICS	COMPETENCIES	SUBTOPICS	AIT	HOURS
1.	**Metabolic response to injury**				
		SU1.3	SGD: 1		1
		AS3.1, AS9.3, AS9.4	Describe basic concepts of perioperative care- preoperative Describe the principles of preoperative evaluation Describe the principles of fluid therapy in the preoperative period	Anaesthesiology	

			Enumerate blood products and describe the use of blood products in the preoperative period		
		SU1.3	SGD: 2		1
			Describe basic concepts of perioperative care.- intraoperative	Anaesthesiology	
		SU1.3,	SGD: 3		1
		AS6.3	Describe basic concepts of perioperative care- postoperative Describe the common complications encountered by patients in the recovery room, their recognition and principles of management	Anaesthesiology	
2.	**Shock**				
		SU2.1,	SGD: 4		1
		PA6.3	Describe Pathophysiology of shock, types of shock & principles of resuscitation including fluid replacement and monitoring. Define and describe shock, its pathogenesis and its stages	Pathology, Physiology	
		SU2.2,	SGD: 5		1
		IM15.3	Describe the clinical features of shock and its appropriate treatment Describe and discuss the physiologic effects of acute blood and volume loss	General Medicine	
3.	**Blood and blood components**				
		SU3.2	SGD: 6		1
		PA22.4	Observe blood transfusions Enumerate blood components and describe their clinical uses	Pathology	
4.	**Burns**				

		SU4.1, SU4.2	SGD: 7		1
			Elicit document and present history in a case of Burns and perform physical examination. Describe Pathophysiology of Burns. Describe Clinical features, Diagnose type and extent of burns and plan appropriate treatment.	Physiology	
		SU4.3	SGD: 8		1
		FM2.25	Discuss the Medicolegal aspects in burn injuries. Describe types of injuries, clinical features, patho-physiology, postmortem findings and medico-legal aspects in cases of burns, scalds, lightening, electrocution and radiations		
					1
				Forensic Medicine	
5.	**Wound healing and wound care**				
		SU5.2, SU5.3	SGD: 9		1
			Elicit, document and present a history in a patient presenting with wounds. Differentiate the various types of wounds, plan and observe management of wounds.		
		SU5.4	SGD:10		1
			Discuss medico legal aspects of wounds		
					1
		FM3.3 , FM3.4	Mechanical injuries and wounds: Define, describe and classify different types of mechanical injuries, abrasion, bruise, laceration, stab wound, incised wound, chop wound, defense wound, self-inflicted/fabricated wounds and their	Forensic Medicine	

		, FM3.6	medico-legal aspects. Mechanical injuries and wounds: define injury, assault & hurt. Describe IPC pertaining to injuries Mechanical injuries and wounds:Describe healing of injury and fracture of bones with its medico-legal importance		
6.	**Surgical infections**				
		SU6.1	SGD:11		1
			Define and describe the aetiology and pathogenesis of surgical	Microbiology	
		MI7.1	Infections Describe the etio-pathogenesis and discuss the laboratory diagnosis of infections of genitourinary system		
		SU6.2	SGD:12		1
			Enumerate Prophylactic and therapeutic antibiotics		
			Plan appropriate management		
7.	**Surgical Audit and Research**				
		SU7.1, SU7.2	SGD:13		1
			Describe the Planning and conduct of Surgical audit Describe the principles and steps of clinical research in General Surgery	Community Medicine	
8.	**Ethics**				
		SU8.1 ,SU8.2	SGD:14		1
			Describe the principles of Ethics as it pertains to General Surgery Demonstrate Professionalism and empathy to the patient undergoing general surgery	Forensic Medicine, AETCOM	

9.	**Investigation of surgical patient**				
		SU9.1	SGD:15		1
			Choose appropriate biochemical, microbiological, pathological, imaging investigations and interpret the investigative data in a surgical patient	Biochemistry,microbiology,pathology	
		SU9.2	SGD 16		
			Biological basis for early detection of cancer and multidisciplinary approach in management of cancer		
10.	**Pre, intra and post-operative management**.				
		SU10.1	SGD:17		1
			Describe the principles of perioperative management of common		
			surgical procedures		
11.	**Nutrition and fluid therapy**				
		SU12.1	SGD:18	Physiology,Biochemistry	1
			Enumerate the causes and consequences of malnutrition in the surgical patient		
		SU12.2	Describe and discuss the methods of estimation and replacement Of the fluid and electrolyte requirements in the surgical patient		

		SU12.3	Discuss the nutritional requirements of surgical patients, the methods of providing nutritional support and their complications		
12.	**Transplantation**				
		SU13.3	SGD: 19	AETCOM	1
			Discuss the legal and ethical issues concerning organ donation		
13.	**Basic Surgical Skills**				
		SU14.2	SGD: 20		1
			Describe Surgical approaches, incisions and the use of appropriate instruments in Surgery in general.		
		SU14.3	SGD: 21		1
			Describe the materials and methods used for surgical wound		
			closure and anastomosis (sutures, knots and needles)		
14	**Biohazard Disposal**	SU15.1	SGD 22	Microbiology, Community medicine	1
		MI8.7	Describe **c**lassification of hospital waste and appropriate methods of disposal Demonstrate Infection control practices and use of Personal Protective Equipments (PPE)		
15.	**Trauma**				
		SU17.3	SGD:23		1
			Describe the Principles in management of mass casualties		
16.	**Skin and Subcutaneous Tissue**		SGD 24		1
		SU18.1 SU18.2	Describe the pathogenesis, clinical features and management of various cutaneous and subcutaneous infections. Classify skin tumors		

		SU18.3	Differentiate different skin tumors and discuss their management. Describe and demonstrate the clinical examination of surgical patient including swelling and order relevant investigation for diagnosis. Describe and discuss appropriate treatment plan.		
17.	**Developmental anomalies of face, mouth and jaws**				
		SU19.1, 19.2	SGD:25	Human Anatomy	1
			Describe the etiology and classification of cleft lip and palate. Describe the Principles of reconstruction of cleft lip and palate		
18	**Oropharyngeal carcinoma**		SGD 26	ENT	1
		SU20.1 SU20.2	Describe etiopathogenesis of oral cancer symptoms and signs of oropharyngeal cancer Enumerate the appropriate investigations and discuss the Principles of treatment		
19.	**Disorders of salivary glands**				
		SU21.1	SGD:27	Human Anatomy	1
		AN34.1 AN28.9	Describe surgical anatomy of the salivary glands, pathology, and clinical presentation of disorders of salivary glands Describe & demonstrate the morphology, relations and nerve supply of submandibular salivary gland & submandibular ganglion		

			Describe & demonstrate the parts, borders, surfaces, contents, relations and nerve supply of parotid gland with course of its duct and surgical importance		
		SU21.2	SGD:28		1
			Enumerate the appropriate investigations and describe the Principles of treatment of disorders of salivary glands		
20.	**Thyroid and Parathyroid Glands**				
		SU22.1, 22.2	SGD:29	Human anatomy, Pathology	1
		AN35.2	Describe the applied anatomy and physiology of thyroid. Describe the etiopathogenesis of thyroidal swellings. Describe & demonstrate location, parts, borders, surfaces, relations & blood supply of thyroid gland		
		SU22.3	SGD:30		1
		PA32.1	Demonstrate and document the correct clinical examination of thyroid swellings and discus the differential diagnosis and their management Enumerate, classify and describe the etiology, pathogenesis, pathology and iodine dependency of thyroid swellings		
		SU22.4, SU22.5	SGD:31		1
		AN35.8	Describe the clinical features, classification and principles of management of thyroid cancer		

			Describe the applied anatomy of parathyroid Describe and discuss the clinical features of hypo - and hyperparathyroidism and the principles of their management Describe the anatomically relevant clinical features of Thyroid swellings		
21.	**Breast**				
		SU 25.1	SGD:32	Human anatomy, Radiodiagnosis	1
		AN9.2	Describe applied anatomy and appropriate investigations for breast disease Breast-Describe the location, extent, deep relations, structure, age changes, blood supply, lymphatic drainage, microanatomy and applied anatomy of breast		
		SU 25.2	SGD:33		1
			Describe the etiopathogenesis, clinical features and principles of management of benign breast disease including infections of the breast.		
22.	**Vascular diseases**				
		SU 27.1, 27.2, 27.3, 27.4	SGD:34	Human Anatomy	1
		AN20.9	Describe the etiopathogenesis, clinical features, investigations and principles of treatment of occlusive arterial disease. Demonstrate the correct examination of the vascular system and enumerate and describe the investigation of vascular disease. Describe clinical features, investigations and principles of management of vasospastic disorders. Describe the types of gangrene and principles of amputation.		

			Identify & demonstrate palpation of vessels (femoral, popliteal, dorsalis pedis, post tibial), Mid inguinal point, Surface projection of: femoral nerve, Saphenous opening, Sciatic, tibial, common peroneal & deep peroneal nerve, great and small saphenous veins		
		SU 27.5, 27.6, 27.7	SGD:35		1
		AN6.3 AN23.7	Describe the applied anatomy of venous system of lower limb. Describe pathophysiology, clinical features, Investigations and principles of management of DVT and Varicose veins. Describe pathophysiology, clinical features, investigations and principles of management of Lymph edema, lymphangitis and Lymphomas. Explain the concept of lymphoedema and spread of tumors via lymphatics and venous system Mention the extent, relations and applied anatomy of lymphatic duct		

MBBS Phase III/II-

Small group teachings/ Tutorials/ Integrated teaching/ Practical's: 125 hours

- Competencies written in red (horizontal) and green (vertical) are of alignment and integration.
- 25 % of allotted time of the third professional shall be utilised for integrated learning with pre- and para-clinical subjects and shall be assessed during the clinical subject's examination.
- This allotted time will be utilised as integrated teaching by para- clinical subjects with clinical subjects (as Applied Anatomy, Clinical Pathology, Clinical Pharmacology, Clinical Microbiology, Radio diagnosis, Instruments, Operative Surgery, Communication skills etc.).

SR. NO.	TOPICS	COMPETENCIES	SUBTOPICS	AIT	HOURS
1.	**Shock**				
		SU 2.3	SGD: 1		1
		PA6.3	Communicate and counsel patients and families about the treatment and prognosis of shock demonstrating empathy and care. Define and describe shock, its pathogenesis and its stages	AETCOM	
2	**Blood and blood components**				
		SU 3.3	SGD: 2		1
		PA22.4	Councell patients and family/friend for blood transfusion and blood donation. Enumerate blood components and describe their clinical uses	Pathology	
3.	**Burns**				
		SU 4.4	SGD: 3		1
			Communicate and counsel patients and families on the outcome and rehabilitating demonstrating empathy and care.		

4.	**Surgical infections**				
		SU 6.1, 6.2,	SGD: 4		1
		OR3.1,OR3.3,OR4.1	Communicate and counsel patients and families on the outcome and rehabilitating demonstrating empathy and care. Describe and discuss the aetiopathogenesis, clinical features, Investigations and principles of management of Bone and Joint infections. Describe and discuss the clinical features, Investigation and principles of management of Tuberculosis affecting major joints (Hip, Knee) including cold abcess and caries spine a) Acute Osteomyelitis b) Subacute osteomyelitis c) Acute Suppurative arthritis d) Septic arthritis & HIV infection e) Spirochaetal infection f) Skeletal Tuberculosis. Participate as a member in team for procedures like drainage of abscess, sequestrectomy/ saucerisation and arthrotomy	Orthopaedics	
5.	**Ethics**				
		SU 8.3	SGD: 5		1
			Discuss Medico-legal issues in surgical practice	Forensic Medicine, AETCOM	
6.	**Investigation of surgical patient**				
		SU 9.2	SGD: 6		1

			Biological basis for early detection of cancer and multidisciplinary approach in management of cancer		
		SU 9.3	SGD: 7		1
			Communicate the results of surgical investigations and counsel the patient appropriately.		
7.	**Pre, intra and post operative management.**				
		SU 10.2	SGD: 8		1
		IM24.11	Describe the steps and obtain informed consent in a simulated environment. Describe and discuss the aetiopathogenesis,clinical presentation, identification, functional changes, acute care, stabilization, management and rehabilitation of the elderly undergoing surgery	AETCOM	
		SU 10.3	SGD: 9		1
			Observe common surgical procedures and assist in minor surgical procedures; observe emergency life saving surgical procedures.		
		SU 10.4	SGD: 10		1
			Perform basic surgical skills such as first aid including suturing and minor surgical procedures in simulated environment.		
8.	**Anaesthesia and Pain Management**				
		SU 11.3	SGD: 11		1
			Demonstrate maintenance of an airway in a mannequin or equivalent.	Anaesthesiology	
		SU 11.1, 11.2	SGD: 12		1

			Describe principles of preoperative assessment. Enumerate the principles of general, regional and local anaesthesia.	Anaesthesiology	
		SU 11.3, 11.4, 11.5	SGD: 13		1
			Enumerate the indications and principles of day care general surgery. Describe principles of providing post-operative pain relief and management of chronic pain. Describe principles of safe General surgery.	Anaesthesiology	
9.	**Nutrition and fluid therapy**				
		SU 12.1, 12.2	SGD: 14		1
			Enumerate the causes and consequnces of malnutrition in the surgical patient. Describe and discuss the methods of estimation and replacement of the fluid and electrolyte requirements in the surgical patient.	Physiology	
		SU 12.3	SGD: 15		1
			Discuss the nutritional requirements of surgical patients, the methods of providing nutritional support and their complications.	Biochemistry	
10.	**Transplantation**				
		SU 13.3	SGD: 16		1
			Discuss the legal and ethical issues concerning organ donation.	AETCOM	
11.	**Biohazard disposal**				
		SU 15.1	SGD: 17		1
			Describe classification of hospital waste and appropriate methods of disposal.	Microbiology	
12.	**Minimally invasive General surgery**				

		SU 16.1	SGD: 18		1
			Minimally invasive General surgery: Describe indications advantages and disadvantages of minimally invasive General surgery.		
13.	**Trauma**				
		SU 17.4	SGD: 19		1
			Describe pathophysiology, mechanism of head injuries.		
		SU 17.5	SGD: 20		1
			Describe clinical features for neurological assessment and GCS in head injuries.		
		SU 17.6,	SGD: 21		1
		PM8.1	Choose appropriate investigations and discuss the principles of management of head injuries. Describe the clinical features, evaluation, diagnosis and management of disability following traumatic brain injury	Physical Medicine & Rehabilitation	
		SU 17.7	SGD: 22		1
		OR11.1	Describe the clinical features of soft tissue injuries. Choose appropriate investigations and discuss the principles of management. Describe and discuss the aetiopathogenesis, clinical features, Investigations and principles of management of benign and malignant bone tumours and pathological fractures	Orthopaedics	
		SU 17.8	SGD: 23		1
			Describe pathophysiology of chest injuries.		
		SU 17.9	SGD: 24		1

			Describe the clinical features and principles of management of chest injuries.		
		SU 17.10	SGD: 25		1
			Demonstrate Airway maintenance. Recognise and manage tension pneumothorax, hemothorax and flail chest in simulated environment.	Anaesthesiology	
14.	**Skin and subcutaneous tissue**				
		SU 18.3.	SGD: 26		1
		PM7.9	Describe and demonstrate the clinical examination of surgical patient including swelling and order relevant investigation for diagnosis. Describe and discuss appropriate treatment plan. Enumerate the indications of debridement, and Split thickness skin grafting.	Physical Medicine & Rehabilitation	
15.	**Oropharyngeal cancer**				
		SU 20.1	SGD: 27		1
			Describe etiopathogenesis of oral cancer. Symptoms and signs of oropharyngeal cancer.	ENT	
		SU 20.2	SGD: 28		1
			Enumerate the appropriate investigations for oropharyngeal cancer.		
		SU 20.2	SGD: 29		1
			Enumerate the appropriate investigations for oropharyngeal cancer.		
		SU 20.3	SGD: 30		1
			Enumerate the principles of treatment for oropharyngeal cancer.		
		SU 20.3	SGD: 31		1

			Enumerate the principles of treatment for oropharyngeal cancer.		
16.	**Adrenal Glands**				
		SU 23.1, 23.2	SGD: 32		1
			Describe the applied anatomy of adrenal glands. Describe the etiology, clinical features and principles of management of disorders of adrenal glands.	Human Anatomy,General Medicine	
		SU 23.3	SGD: 33		1
			Describe the clinical features, principles of investigation and management of adrenal tumors.		
17.	**Pancreas**				
		SU 24.1,	SGD: 34		1
		PA32.6	Describe the clinical features, principles of investigation, prognosis and management of pancreatitis. Describe the etiology, pathogenesis, manifestations, laboratory, morphologic features, complications and metastases of pancreatic cancer	Human Anatomy	
		SU 24.2	SGD: 35		1
			Describe the clinical features, principles of investigation, prognosis and management of pancreatic endocrine tumors.		
		SU 24.3	SGD: 36		1
			Describe the principles of investigation and management of pancreatic disorders including pancreatitis and endocrine tumors.		

18.	**Breast**				
		SU 25.3	SGD: 37		1
			Describe the etiopathogenesis, clinical features, investigations and principles of treatment of benign and malignant tumors of breast.	Radiodiagnosis	
		SU 25.3	SGD: 38		1
			Describe the etiopathogenesis, clinical features, investigations and principles of treatment of benign and malignant tumors of breast.	Radiodiagnosis	
		SU 25.4	SGD: 39		1
			Counsel the patient and obtain informed consent for treatment of malignant conditions of the breast.		
		SU 25.5	SGD: 40		1
			Demonstrate the correct technique to palpate the breast for breast swelling in a mannequin or equivalent.		
19.	**Cardio-thoracic General Surgery-Chest- Heart and Lungs**				
		SU 26.1	SGD: 41		1
			Outline the role of surgery in the management of coronary heart disease, valvular heart diseases and congenital heart diseases.		
		SU 26.2	SGD: 42		1
			Outline the role of surgery in the management of diseases of Thorax and Diaphragm		
		SU 26.3	SGD: 43		1

			Describe the clinical features of mediasitnal diseases and the principles of management.		
		SU 26.4	SGD: 44		1
			Describe the etiology, pathogenesis, clinical features of tumors of the lung and the principles of management.		
20.	**Vascular Diseases**				
		SU 27.1	SGD: 45		1
			Describe the etiopathogenesis, clinical features, investigations and principles of treatment of occlusive arterial disease.		
		SU 27.2	SGD: 46		1
			Demonstrate the correct examination of the vascular system and enumerate and describe the investigation of vascular disease.		
		SU 27.3	SGD: 47		1
			Describe clinical features, investigations and principles of management of vasospastic disorders.		
		SU 27.4	SGD: 48		1
			Describe the types of gangrene and principles of amputation.		
		SU 27.5	SGD: 49		1
			Describe the applied anatomy of the venous system of lower limb.		
		SU 27.6	SGD: 50		1
			Describe pathophysiology , clinical features, investigations and principles of management of DVT and varicose veins.		
		SU 27.7	SGD: 51		1

			Describe pathophysiology, clinical features, Investigations and principles of management of lymph edema, lymphangitis and lymphomas.		
		SU 27.8	SGD: 52		1
			Demonstrate the correct examination of the lymphatic system.		
21.	**Abdomen**				
		SU 28.1 .	SGD: 53 .		1
		AN44.1.	Describe pathophysiology, clinical features, Investigations and principles of management of Hernias . Describe & demonstrate the Planes (transpyloric, transtubercular, subcostal, lateral vertical, linea alba, linea semilunaris), regions & Quadrants of abdomen .	Human Anatomy	
		SU 28.1 .	SGD: 54		1
		AN44.4 . AN44.5	Describe pathophysiology, clinical features, Investigations and principles of management of Hernias . Describe & demonstrate extent, boundaries, contents of Inguinal canal including Hesselbach's triangle.	Human Anatomy	
		SU 28.1	SGD: 55		1
			Describe pathophysiology, clinical features, Investigations and principles of management of Hernias		
		SU 28.1	SGD: 56		1
		AN44.4 . AN44.5	Describe pathophysiology, clinical features, Investigations and principles of management of Hernias .	Human Anatomy	

			Explain the anatomical basis of inguinal hernia.		
		SU 28.1	SGD: 57		1
		AN15.3	Describe pathophysiology, clinical features, Investigations and principles of management of Hernias . Describe and demonstrate boundaries, floor, roof and contents of femoral triangle	Human Anatomy	
		SU 28.1,AN44.6,	SGD: 58		1
			Describe pathophysiology, clinical features, Investigations and principles of management of Hernias. Describe & demonstrate attachments of muscles of anterior abdominal wall	Human Anatomy	
		SU 28.3	SGD: 59		1
			Describe causes, clinical features, complications and principles of mangament of peritonitis		
		SU 28.3	SGD: 60		1
			Describe causes, clinical features, complications and principles of managament of peritonitis		
		SU 28.3	SGD: 61		1
		AN47.5	Describe causes, clinical features, complications and principles of mangament of omental pathologies. Describe & demonstrate major viscera of abdomen under following headings (anatomical position, external and internal features, important peritoneal and other relations, blood supply, nerve supply, lymphatic drainage and applied aspects)	Human Anatomy	

		SU 28.4	SGD: 62		1
			Describe pathophysiology, clinical features, investigations and K principles of management of Intra-abdominal abscess, mesenteric cyst, and retroperitoneal tumors		
		SU 28.5	SGD: 63		1
		IM19.9	Describe the applied Anatomy and physiology of esophagus. Enumerate the indications for use of Surgery and botulinum toxin in the treatment of movement disorders	Human Anatomy, Physiology	
		SU 28.5,	SGD: 64		1
		IM15.4, IM15.6	Describe the applied Anatomy and physiology of esophagus. Elicit document and present an appropriate history that identifies the route of bleeding, quantity, grade, volume loss, duration, etiology, comorbid illnesses and risk factors. Distinguish between upper and lower gastrointestinal bleeding based on the clinical features	Human Anatomy, Physiology	
		SU 28.6,	SGD: 65		1
			Describe the clinical features, investigations and principles of management of benign and malignant disorders of esophagus.		
		SU 28.6	SGD: 66		1
			Describe the clinical features, investigations and principles of management of benign and malignant disorders of esophagus		
		SU 28.7	SGD: 67		1

			Describe the applied anatomy and physiology of stomach	Human Anatomy	
		SU 28.8,	SGD: 68		1
		IM15.15	Describe and discuss the aetiology, the clinical features, investigations and principles of management of congenital hypertrophic pyloric stenosis, Peptic ulcer disease, Carcinoma stomach. Describe and enumerate the indications, pharmacology and side effects of pharmacotherapy of acid peptic disease including Helicobacter pylori		
		SU 28.9	SGD: 69		1
		IM15.2	Demonstrate the correct technique of examination of a patient with disorders of the stomach. Enumerate describe and discuss the evaluation and steps involved in stabilizing a patient who presents with acute volume loss and GI bleed		
		SU 28.10	SGD: 70		1
		IM5.16	Describe the applied anatomy of liver. Describe the clinical features, Investigations and principles of management of liver abscess, hydatid disease, injuries and tumors of the liver. Describe and discuss the management of hepatitis, cirrhosis, portal hypertension, ascites, spontaneous, bacterial peritonitis and hepatic encephalopathy	Human Anatomy	
		SU 28.10	SGD: 71		1

			Describe the applied anatomy of liver. Describe the clinical features, Investigations and principles of management of liver abscess, hydatid disease, injuries and tumors of the liver	Human Anatomy	
		SU 28.10	SGD: 72		1
			Describe the applied anatomy of liver. Describe the clinical features, Investigations and principles of management of liver abscess, hydatid disease, injuries and tumors of the liver	Human Anatomy	
		SU 28.11	SGD: 73		1
			Describe the applied anatomy of spleen. Describe the clinical features, investigations and principles of management of splenic injuries. Describe the post-splenectomy sepsis - prophylaxis	Human Anatomy	
		SU 28.11	SGD: 74		1
		PA24.5	Describe the applied anatomy of spleen. Describe the clinical features, investigations and principles of management of splenic injuries. Describe the post-splenectomy sepsis – prophylaxis Describe and etiology and pathogenesis and pathologic features of Tuberculosis of the intestine		
		SU 28.12	SGD: 75		1
			Describe the applied anatomy of biliary system. Describe the clinical features,		

			investigations and principles of management of diseases of biliary system		
		SU 28.12	SGD: 76		1
			Describe the applied anatomy of biliary system. Describe the clinical features, investigations and principles of management of diseases of biliary system		
		SU 28.12	SGD: 77		1
			Describe the applied anatomy of biliary system. Describe the clinical features, investigations and principles of management of diseases of biliary system		
		SU 28.12	SGD: 78		1
		AN47.2,PA24.6	Describe the applied anatomy of biliary system. Describe the clinical features, investigations and principles of management of diseases of biliary system. Discuss Paediatric surgery biliary disorders. Name & identify various peritoneal folds & pouches with its explanation. Describe and etiology and pathogenesis and pathologic and distinguishing features of inflammatory bowel disease	Human Anatomy	
		SU 28.12	SGD: 79		1
		AN47.1	Describe the applied anatomy of biliary system. Describe the clinical features, investigations and principles of management of diseases of biliary system. Discuss Choledochal cyst. Describe & identify boundaries and recesses of Lesser & Greater sac	Human Anatomy	

		SU 28.13, 28.14	SGD: 80		1
		PA24.7	Describe the applied anatomy of small and large intestine Describe the etiology and pathogenesis and pathologic and distinguishing features of carcinoma of the colon	Human Anatomy, Physiology	
		SU 28.13, 28.14	SGD: 81		1
			Describe the clinical features, investigations and principles of management of disorders of small and large intestine including neonatal obstruction and Short gut syndrome		
		SU 28.13, 28.14	SGD: 82		1
			Describe the clinical features, investigations and principles of management of disorders of small and large intestine including neonatal obstruction and Short gut syndrome		
		SU 28.13, 28.14	SGD: 83		1
			Describe the clinical features, investigations and principles of management of disorders of small and large intestine including neonatal obstruction and Short gut syndrome		
		SU 28.13, 28.14	SGD: 84		1
			Describe the clinical features, investigations and principles of management of disorders of small and large intestine including neonatal obstruction and Short gut syndrome		
		SU 28.13, 28.14	SGD: 85		1

			Describe the clinical features, investigations and principles of management of disorders of small and large intestine including neonatal obstruction and Short gut syndrome		
		SU 28.13, 28.14	SGD: 86		1
			Describe the clinical features, investigations and principles of management of disorders of small and large intestine including neonatal obstruction and Short gut syndrome		
		SU 28.13, 28.14	SGD: 87		1
		AN55.2	Describe the clinical features, investigations and principles of management of disorders of small and large intestine including neonatal obstruction and Short gut syndrome Demonstrate the surface projections of: stomach, liver, fundus of gall bladder, spleen, duodenum, pancreas, ileocaecal junction, kidneys & root of mesentery	Human Anatomy	
		SU 28.13, 28.14	SGD: 88		1
			Describe the clinical features, investigations and principles of management of disorders of small and large intestine including neonatal obstruction and Short gut syndrome		
		SU 28.13, 28.14	SGD: 89		1
			Describe the clinical features, investigations and principles of management of disorders of small and large intestine including		

			neonatal obstruction and Short gut syndrome		
		SU 28.15	SGD: 90		1
			Describe the clinical features, investigations of diseases of Appendix including appendicitis and its complications.		
		SU 28.15	SGD: 91		1
		AN55.1	Describe the principles of management diseases of Appendix including appendicitis and its complications. Demonstrate the surface marking of regions and planes of abdomen, superficial inguinal ring, deep inguinal ring , McBurney's point, Renal Angle & Murphy's point	Human Anatomy	
		SU 28.16	SGD: 92		1
			Describe applied anatomy including congenital anomalies of the rectum and anal canal	Human Anatomy	
		SU 28.16	SGD: 93		1
			Describe applied anatomy including congenital anomalies of the rectum and anal canal	Human Anatomy	
		SU 28.16	SGD: 94		1
			Describe applied anatomy including congenital anomalies of the rectum and anal canal		
		SU 28.17	SGD: 95		1
			Describe the clinical features, investigations and principles of management of common anorectal diseases		
		SU 28.17	SGD: 96		1

			Describe the clinical features, investigations and principles of management of common anorectal diseases		
		SU 28.17	SGD: 97		1
			Describe the clinical features, investigations and principles of management of common anorectal diseases		
22.	**Urinary System**				
		SU 29.1	SGD: 98		1
			Describe the causes, investigations and principles of management of Hematuria		
		SU 29.2	SGD: 99		1
			Describe the clinical features, investigations and principles of management of congenital anomalies of genitourinary system	Human Anatomy	
		SU 29.2	SGD: 100		1
			Describe the clinical features, investigations and principles of management of congenital anomalies of genitourinary system	Human Anatomy	
		SU 29.3	SGD: 101		1
			Describe the Clinical features, Investigations and principles of management of urinary tract infections	Microbiology	
		SU 29.3	SGD: 102		1
		PA28.10	Describe the Clinical features, Investigations and principles of management of urinary tract infections including renal TB and abscess. Describe the etiology, pathogenesis, pathology, laboratory findings, distinguishing features progression and complications of acute and chronic pyelonephritis and reflux nephropathy	Microbiology, Pathology	

		SU 29.4	SGD: 103		1
			Describe the clinical features, investigations and principles of management of hydronephrosis		
		SU 29.4	SGD: 104		1
			Describe the clinical features, investigations and principles of management of hydronephrosis		
		SU 29.5	SGD: 105		1
		PA28.13	Describe the clinical features,investigations and principles of management of renal calculi. Define, classify and describe the etiology, pathogenesis, pathology, laboratory urinary findings, distinguishing features, progression and complications of renal stone disease and obstructive uropathy	Pathology	
		SU 29.5	SGD: 106		1
			Describe the clinical features,investigations and principles of management of renal calculi		
		SU 29.6	SGD: 107		1
			Describe the clinical features, investigations and principles of management of renal tumours		
		SU 29.7	SGD: 108		1
			Describe the principles of management of acute and chronic retention of urine		
		SU 29.7	SGD: 109		1
		PA28.16	Describe the principles of management of acute and chronic retention of urine.	Pathology	

			Describe the etiology, genetics, pathogenesis, pathology, presenting features and progression of urothelial tumors		
		SU 29.8	SGD: 110		1
			Describe the clinical features, investigations and principles of management of bladder cancer		
		SU 29.8	SGD: 111		1
			Describe the clinical features, investigations and principles of management of bladder cancer		
		SU 29.9	SGD: 112		1
			Describe the clinical features, investigations and principles of management of disorders of prostate		
		SU 29.9	SGD: 113		1
			Describe the clinical features, investigations and principles of management of disorders of prostate		
		SU 29.10	SGD: 114		1
			Demonstrate a digital rectal examination of the prostate in a mannequin or equivalent		
		SU 29.10	SGD: 115		1
			Describe clinical features, investigations and management of urethral strictures		
		SU 29.10	SGD: 116		1
		OG26.2	Describe clinical features, investigations and management of urethral strictures and urethral injuries.	Obstetrics and gynaecology	

			Describe the causes, prevention, clinical features, principles of management of genital injuries and fistulae		
23.	**Penis, Testis and scrotum**				
		SU 30.1	SGD: 117		1
		AN46.1	Describe the clinical features, investigations and principles of management of phimosis, paraphimosis. Describe & demonstrate coverings, internal structure, side determination, blood supply, nerve supply, lymphatic drainage & descent of testis with its applied anatomy	Human Anatomy	
		SU 30.1	SGD: 118		1
		PA29.1 PE21.14	Describe the clinical features, investigations and principles of management of phimosis, paraphimosis. Classify testicular tumors and describe the pathogenesis, pathology, presenting and distinguishing features, diagnostic tests, progression and spread of testicular tumors. Recognize common surgical conditions of the abdomen and genitourinary system and enumerate the indications for referral including acute and subacute intestinal obstruction, appendicitis, pancreatitis, perforation, intussusception, Phimosis, undescended testis, Chordee, hypospadiasis,Torsion testis, hernia Hydrocele, Vulval Synechiae	Pathology	
		SU 30.1,	SGD: 119		1

		PA29.2	Describe the clinical features, investigations and principles of management of phimosis, paraphimosis. Describe the pathogenesis, pathology, presenting and distinguishing features, diagnostic tests, progression and spread of carcinoma of the penis	Pathology	
		SU 30.1	SGD: 120		1
		PA29.4	Describe the clinical features, investigations and principles of management of carcinoma penis. Describe the pathogenesis, pathology, hormonal dependency, presenting and distinguishing features, diagnostic tests, progression and spread of carcinoma of the prostate	Pathology	
		SU 30.2	SGD: 121		1
			Describe the applied anatomy clinical features, investigations and principles of management of undescended testis.	Human Anatomy	
		SU 30.3	SGD: 122		1
			Describe the applied anatomy clinical features, investigations and principles of management of epidydimo-orchitis	Human Anatomy	
		SU 30.4	SGD: 123		1
			Describe the applied anatomy clinical features, investigations and principles of management of varicocele	Human Anatomy	
		SU 30.5	SGD: 124		1
			Describe the applied anatomy clinical features, investigations and principles of management of hydrocoele	Human Anatomy	

		SU 30.4	SGD: 125		1
			Describe classification, clinical features, investigations and principles of management of tumours of testis		

Internal Assessment

Subject: General surgery and allied including Orthopedics

Applicable for batches admitted from 2019 and onwards

Phase	IA – 1 -Exam			IA – 2 -Exam		
	Theory General Surgery Only (January)	**Practical EOP**	Total Marks	**Theory General Surgery Only (May)**	**Practical of Allied EOP**	Total Marks
Second MBBS	50	50	100	50	Orthopedics = 25 Radiodiagnosis = 25	100

Phase	IA – 3 -Exam			IA – 4 -Exam		
	Theory General Surgery + allied) (January)	**Practical EOP**	Total Marks	**Theory General Surgery + allied) (April)**	**Practical of Allied EOP**	Total Marks
III MBBS Part I	50	50	100	50	Orthopaedics =25 Anaesthesia =25	100

Phase	IA – 5 - Exam			Prelim Exam (As per university pattern)		
	Theory Gen Surgery + Allied (May)	**Practical End of** 8 Weeks posting	Total Marks	**Theory (November)**	**Practical (November)**	Total Marks
III MBBS Part II	100	100	200	100 x 2 papers = 200	200	400

(There will be FORMATIVE ASSESSMENT at the End of four weeks Clinical Posting of General Surgery NOT to be added to INTERNAL ASSESSMENT)**.**

Assessment in CBME is **ONGOING PRCESS**,

No Preparatory leave is permitted.

1. There shall be 6 internal assessment examinations in General Surgery including allied.

2. The suggested pattern of question paper for internal assessment internal examinations, except prelim examination is attached at the end. Pattern of the prelims examinations should be similar to the University examinations.

3. Internal assessment marks for theory and practical will be converted to out of 50 (theory) +50 (practical). Internal assessment marks, after conversion, should be submitted to university within the stipulated time as per directives from the University.

4. **Conversion Formula for calculation of marks in internal assessment examinations**

	Theory	**Practical**
Phase II	100	100
Phase III/I	100	100
Phase III/II	300	300
Total	**500**	**500**
Conversion out of	**50**	**50**
Conversion formula	**Total marks in 6 IA theory examinations /10**	**Total marks in 6 IA Practical examinations /10**
Eligibility criteria after conversion	**20**	**20**
	Combined theory + Practical = 50	

5. While preparing Final Marks of Internal Assessment, the rounding-off marks shall done as illustrated in following table.

Total Internal Assessment Marks	Final rounded marks
33.01 to 33.49	33
33.50 to 33.99	34

6. Students must secure at least 50% marks of the total marks (combined in theory and practical / clinical; not less than 40 % marks in theory and practical separately) assigned for internal assessment in order to be eligible for appearing at the final University examination of that subject.
7. Internal assessment marks will not to be added to marks of the University examinations and will be shown separately in mark list.

8. Remedial measures

A. Remedial measures for non-eligible students

i) At the end of each internal assessment examination, students securing less than 50% marks shall be identified. Such students should be counseled at the earliest and periodically. Extra classes for such students may be conducted, if needed.
ii) If majority of the students found to be weak in a particular area then extra classes must be scheduled for all such students.
iii) Even after these measures, if a student is failed to secure 50% marks combined in theory and practical (40% separately in theory and practical) after prelim examination, the student shall not be eligible for final examination.
iv) Non eligible candidates are offered to reappear for repeat internal assessment examination/s, which must be conducted 2 months before next University examination. Extra classes for such students may be conducted for such students. The pattern for this repeat internal assessment examination shall be similar to the final University examination. Only the marks in this examination shall be considered for deciding the eligibility criteria. Following conversion formula shall be used for converting the marks.

	Theory	Practical
Remedial examination (as per final examination)	**200**	**200**
Conversion out of	**50**	**50**
Conversion formula	**Marks in remedial theory examinations /4**	**Marks in remedial Practical examinations /4**
Eligibility criteria after conversion	**20**	**20**
	Combined theory + Practical = 50	

B. Remedial measures for absent students:

i. If any of the students is absent for any of the 6 IA examinations due to any reasons, following measures shall be taken.
ii. The student is asked to apply to the academic committee of the college for reexamination, through HOD, to ascertain the genuineness of the reason for absentee.
iii. If permitted by academic committee, an additional examination for such students is to be conducted after prelims examination. Marks for such additional examination shall be equal to the missed examination.
iv. Even if a student has missed more than one IA examination, he/she can appear for only one additional IA examination. In such scenario, eligibility should be determined by marks obtained in internal assessment examinations for which the candidate has appeared, without changing the denominator of 500.

Internal Assessment Practical Examinations

II MBBS

Internal Assessment - 1

General Surgery

Clinical A (30)			OSCE & Viva B (20)		
Long Case	Demonstration of clinical signs	Communication skills	OSCE & Table viva (20)		Grand Total A +B= 50
			OSCE of Psychomotor Skills	Table viva [Surgical pathology, X rays, Instruments, Logbook, Journal]	
20	5	5	10	10	50

Internal Assessment - 2

Orthopaedics and Radiodiagnosis (to be conducted at the end of respective clinical postings)

Subject: General Surgery Allied Practical (IA – 2) Examination in Orthopaedics			
Case	OSCE 1	Viva (Surgical Pathology, Radiology, Instruments and Surgical Procedure, Journal / log book)	Practical Total
10	5	10	25

Subject: General Surgery Allied Practical (IA – 2) Examination in Radiodiagnosis			
X-Ray and other diagnostic modalities - Basics	Viva (Knowledge of legal aspects, radiation protection etc)	Journal / log book	Practical Total
15	5	5	25

* The marks for internal assessment – 2 shall be communicated by orthopedics / Radiology department to General Surgery department immediately after completion of examination and assessment.

III MBBS Part I

Internal Assessment - 3

General Surgery

Clinical A (30)			OSCE & Viva B (20)		
Long Case	Demonstration of clinical signs	Communication skills	OSCE & Table viva		Grand Total A +B= 50
			OSCE of Psychomotor Skills	Table viva [Surgical pathology, X rays, Instruments, Logbook, Journal]	
20	5	5	10	10	50

Internal Assessment - 4

Orthopaedics and Anaesthesia

Subject: General Surgery Allied Practical (IA – 2) Examination in Orthopaedics			
Case	OSCE 1	Viva (Surgical Pathology, Radiology, Instruments and Surgical Procedure, Journal / log book)	Practical Total
10	5	10	25

Subject: General Surgery Allied Practical (IA – 2) Examination in Anesthesia			
OSCE	Drugs, Instruments	Viva	Practical Total
10	8	7	25

* The marks for internal assessment – 4 shall be communicated by orthopedics / Anaesthesia department to General Surgery department immediately after completion of examination and assessment.

III MBBS Part II

Internal Assessment - 5

General Surgery

Clinical A (60)			OSCE & Viva B (40)		
Long Case	Demonstration of clinical signs	Communication skills	OSCE & Table viva (40)		Grand Total A +B= 100
			OSCE of Psychomotor Skills	Table viva [Surgical pathology, X rays, Instruments, Logbook, Journal]	
40	10	10	20	20	100

MUHS final practical examination

General Surgery

Seat No.	**Long Case General Surgery including communication skill (60)**		**Short Case 1 General Surgery (30)**		**Short Case 2 Ortho (30)**		**General Surgery (60) OSCE # & Table viva**			**Ortho (20)**	**Grand Total**
	Long case	Communication skills *	Short case	Clinical signs demo	Short case	Clinical signs demo	Instruments +Procedure+ Log book	X rays + Surgical Pathology +Journal	OSCE	OSCE (10) + Table (10)	
	50	10	20	10	20	10	20	20	20	20	200

OSCE Stations may include General examinations, Local examinations, psychomotor skills, Communication skills, AETCOM etc.

*Communication skills to be assessed by Kalamazoo Consensus, clinical signs to be assessed by either GLOBAL Rating Scale or OSCE, Psychomotor Skills to be assessed by OSCE with checklist. If the skills are small, 2 or 3 skills may be combined.

MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES, NASHIK

Format / Skeleton of question paper for 1st & 2nd internal

Assessment Theory Examinations.

Instructions:

SECTION "A" MCQ

1) *Put ☒ in the appropriate box below the question number once only.*
2) *Use blue ball point pen only.*
3) *Each question carries **one mark.***
4) *Students will not be allotted mark if he/she overwrites strikes or put white ink on the cross once marked.*

SECTION "A" MCQ (10Marks)

1. Multiple Choice Questions (Total -10 MCQ of One mark each from General surgery) (1x10=10)

a) b) c) d) e) f) g) h) i) j)

Instructions:

1) *Use **blue/black** ball point pen only.*
2) ***Do not** write anything on the **blank portion of the question paper**. If written anything, such type of act will be considered as an attempt to resort to unfair means.*
3) ***All** questions are **compulsory**.*
4) *The number to the **right** indicates **full** marks.*
5) *Draw diagrams **wherever** necessary.*

2. Long Answer Question (Any 2 out of 3) (General surgery) (2 x 10 = 20)

a) b) c)

3. Short answer questions (Any 4 out of 5) (At least2 Clinical reasoning question) (General surgery) (4 x 5 = 20)

a) b) c) d) e)

Format / Skeleton of question paper for 3rd and 4th internal

Assessment Theory Examinations (III MBBS Part I)

SECTION "A" MCQ

Instructions:

5) *Put ☒ in the appropriate box below the question number once only.*
6) *Use blue ball point pen only.*
7) *Each question carries **One mark.***
8) *Students will not be allotted mark if he/she overwrites strikes or put white ink on the cross once marked.*

SECTION "A" MCQ (10Marks)

1. Multiple Choice Questions (Total -10 MCQ of One mark each from General surgery) (1x10=10)

a) b) c) d) e) f) g) h) i) j)

Instructions:

1) *Use **blue/black** ball point pen only.*
2) ***Do not** write anything on the **blank portion of the question paper**. If written anything, such type of act will be considered as an attempt to resort to unfair means.*
3) ***All** questions are **compulsory**.*
4) *The number to the **right** indicates **full** marks.*
5) *Draw diagrams **wherever** necessary.*

2. Long Answer Question (Any 2 out of 3) (General surgery) (2 x 10 = 20)

b) b) c)

3. Short answer questions (1 from AETCOM) (General surgery) (2 x 5 = 10)

a) b)

4. Short answer questions (Any 2 out of 3) (At least 2 Clinical reasoning question) (Orthopaedics) (2 x 5 = 10)

a) b) c)

Separate answer sheet for question 4 (SAQ from orthopaedics) may be used for the ease of evaluation.

Format / Skeleton of question paper 5th internal assessment

Theory Examinations (III MBBS Part II)

SECTION "A" MCQ

Instructions:

9) Put ☒ in the appropriate box below the question number once only.
10) Use blue ball point pen only.
*11) Each question carries **One mark.***
12) Students will not be allotted mark if he/she overwrites strikes or put white ink on the cross once marked.

SECTION "A" MCQ (20Marks)

1. Multiple Choice Questions (Total-20MCQ of One mark each - 15 General surgery , 2 orthopaedics, 1 anesthesia, 1 dentistry and 1 radiology) (1 x20=20)

a) b) c) d) e) f) g) h) i) j)

k) l) m) n) o) p) q) r) s) t)

SECTION "B" & "C"

Instructions:

*1) Use **blue/black** ball point pen only.*
*2) **Do not** write anything on the **blank portion of the question paper**. If written anything, such type of act will be considered as an attempt to resort to unfair means.*
*3) **All** questions are **compulsory**.*
*4) The number to the **right** indicates **full** marks.*
*5) Draw diagrams **wherever** necessary.*

SECTION "B"

2 . Long Answer Questions (Structured Case Based) (General Surgery) (2x15=30)

a) b)

3.Short Answer Questions (Any 3 out of 4) (Any one should be Clinical reasoning), 1 from AETCOM (General Surgery) (3x5=15)

a) b) c) d)

SECTION "C"

4. Short Answer Questions (1 Orthopedics, 1 Anesthesia, 1 Dentistry or Radiodiagnosis) (4 x5=20)

a) b) c) d)

5. Long Answer Question (Structured Case Based) (Orthopedics) (1 x15=15)

a)

Separate answer sheet for question 5 (LAQ from orthopaedics) may be used for the ease of evaluation.

Format / Skeleton of question paper for University Theory Examinations (III MBBS Part II) Paper – I

(Subject names to be removed)

SECTION "A" MCQ

Instructions:

13) Put ☒ in the appropriate box below the question number once only.
14) Use blue ball point pen only.
*15) Each question carries **One mark.***
16) Students will not be allotted mark if he/she overwrites strikes or put white ink on the cross once marked.

SECTION "A" MCQ (20Marks)

1. Multiple Choice Questions (Total-20MCQ of One mark each) – (General surgery) (1 x20=20)

a) b) c) d) e) f) g) h) i) j)

k) l) m) n) o) p) q) r) s) t)

SECTION "B" & "C"

Instructions:

*1) Use **blue/black** ball point pen only.*
*2) **Do not** write anything on the **blank portion of the question paper**. If written anything, such type of act will be considered as an attempt to resort to unfair means.*
*3) **All** questions are **compulsory**.*
*4) The number to the **right** indicates **full** marks.*
*5) Draw diagrams **wherever** necessary.*

SECTION "B"

2 . Long Answer Questions (Structured Case Based) (General Surgery) (2x15=30)

a) b)

3.Short Answer Questions (Any one should be Clinical reasoning, 1 from AETCOM) (General Surgery) (3x5=15)

a) b) c)

SECTION "C"

4. Long Answer Question (Structured Case Based) (General Surgery) (1 x15=15)

a)

3.Short Answer Questions (General Surgery) (Any 4 out of 5) (4 x5=20)

a) b) c) d) e)

Format / Skeleton of question paper for University Theory Examinations (III MBBS Part II) Paper II

(Subject names to be removed)

SECTION "A" MCQ

Instructions:

17) Put ☒ in the appropriate box below the question number once only.
18) Use blue ball point pen only.
*19) Each question carries **One mark.***
20) Students will not be allotted mark if he/she overwrites strikes or put white ink on the cross once marked.

SECTION "A" MCQ (20Marks)

1. Multiple Choice Questions (Total-20MCQ of One mark each - 15 General surgery , 2 orthopedics, 1 anesthesia, 1 dentistry and 1 radiology) (1 x20=20)

a) b) c) d) e) f) g) h) i) j)

k) l) m) n) o) p) q) r) s) t)

SECTION "B" & "C"

Instructions:

*1) Use **blue/black** ball point pen only.*
*2) **Do not** write anything on the **blank portion of the question paper**. If written anything, such type of act will be considered as an attempt to resort to unfair means.*
*3) **All** questions are **compulsory**.*
*4) The number to the **right** indicates **full** marks.*
*5) Draw diagrams **wherever** necessary.*

SECTION "B"

2 . Long Answer Questions (Structured Case Based) (General Surgery) (2x15=30)

a) b)

3.Short Answer Questions (any 5 out of 6) (1 Gen. Surgery, 2 Radiodiagnosis, 2 Anesthesia, 1 Dentistry) (5x5=25)

a) b) c) d) e) f)

SECTION "C"

4. Long Answer Question (Structured Case Based) (Orthopedics) (1 x15=15)

a)

3.Short Answer Questions (Any 2 out of 3) (Orthopedics) (2 x5=10)

a) b) c)

Paper wise distribution of topics for Prelim & MUHS Annual Examination

Year: **III-II MBBS** Subject: **_General Surgery and allied**

Paper	Section	Topics
I	A	MCQs on all topics of paper I of Surgery
	B	Metabolic response to injury, Shock, Blood and blood components, Burns, Wound healing and wound care, Surgical infections, Surgical Audit and Research, Nutrition and fluid therapy, Transplantation, Biohazard disposal, Trauma, Skin and subcutaneous tissue, Developmental anomalies of face, mouth and jaws, Oropharyngeal cancer, Disorders of salivary glands, Endocrine General Surgery: Thyroid and parathyroid, Adrenal glands, Breast, Vascular diseases, Ethics & AETCOM (module 4.3,4.5,4.6)
	C	Abdomen- including Hernia, Peritoneum, GIT tract including esophagus, stomach, small intestine, colon rectum and anal canal, Liver , Spleen, Pancreas, Biliary tract , Minimally invasive Surgery, Pediatric surgery
II	A	MCQs on all topics of the paper II including orthopaedics, anaesthesia, radiology , radiotherapy and dentistry .
	B	Cardio-thoracic - Chest - Heart and Lungs ,Urinary System- Kidney ureter and urinary bladder , Penis, Testis and scrotum, Plastic surgery, Oncology, Investigation of surgical patient, Pre, intra and post- operative management Radiology, Radiotherapy, Anesthesia and pain management , Dentistry
	C	Orthopedics ,

Name of the Institute

Department of General Surgery

Journal

Name of the Student: _____

Roll Number: _____

Batch: _____

Address: _____

_____

Mobile number: _____

Email id: _____

YOUR OPPORTUNITY

Here, for instance is a poor fellow who has just been through to the hospital, in an ambulance. A string of questions about himself and his family has been fired at him, his valuables and even his clothes, have been taken away from him and he is wheeled into the ward on stretcher miserable, scared, defenseless and in his nakedness, unable to run away. He is lifted into a bed, because conscious of the fact, that he is the center of interest in the ward, wishes that he had stayed at home among friends, and just as he is beginning to take stock, he finds a thermometer being stuck under his tongue. It is all strange and new and he wonders what is going to happen next. This thing that does happen is that a man in a long white coat sits down by his bedside and start to examine him. Do you seewhat an opportunity you have? This foundation of your whole relation with that patient is laid in those first few minutes of contact just as it happens in private practice. Here is a worried lonely, suffering man and if youbegin by approaching him with sympathy, tact, and consideration, you get his confidence and he becomes your patient intimate and visiting physicians may come and go and the hierarchy gives them a precedence; but if you make the most of your opportunities, he will regard you as his personal physician and all theres this more consultants.

Sayings of the great:

To study the phenomenon of disease without books is to sail an uncharted sea, while to study books without patients is not to go to sea at all.

-Sir William Osler

The good physician treats the disease, the great physician treats the patient who has the disease.

-Sir William Osler

Observe, record, tabulate, communicate. Use your five senses. Learn to see, learn to hear, learn to feel, learn to smell and know that by practice alone you can become expert.

-Sir William Osler

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Clinical Posting Completion Certificate

This is to certify that the candidateMr./Ms. _____
Registration no. _____ admitted in the year _____ in the _____
_____ Medical College has satisfactorily completed / hasnotcompleted all assignments /requirements/posting mentioned in
this journal and journal for final MBBS (II/III-I/III-II) in General Surgery during the period from .....to……She / He is / is not eligible to appear for thesummative(University) assessment as on the date given below.

Signature of Head of Department

Date

GENERAL INSTRUCTIONS

1) The journal is a record of the academic / co-curricular activities of the designatedstudent,whowouldberesponsibleformaintaininghis/herjournal.

2) The student is responsible for getting the entries in the journal verified by the Faculty in chargeregularly.

3) Entries in the journal will reflect the activities undertaken in the department& have to be scrutinized by the Head of the concerneddepartment.

4) The journal is a record of various activities by the studentlike:
- Overall participation &performance
- Attendance
- Participation insessions
- Record of completion of pre-determinedactivities.
- Acquisition of selectedcompetencies

5) The journal is the record of work done by the candidate in that department / specialty and should be verified by the college before submitting the application of the students for the Universityexamination.

6)*Proposednumberofcaserecordsshouldbementionedinthejournal-:

Phase 2- 1st clinical posting (4 weeks) = 4 General surgery cases + 2 Follow-up cases + OT record sheet minimum 6 cases (2 major and 4 minor) + Asepsis, Basic bandaging skill performed independently and to get it certified

Phase3- 2ndclinicalposting (4 weeks) = 4Generalsurgerycases+ 2follow-up cases + OT record sheet minimum 6 cases (2 major and 4 minor) + Basic wound care skill performed independently and to get it certified

Casualty posting- To write reflection on 2 cases seen in casualty.

Phase 4- 3rd Clinical Posting (8 weeks) = 10 General Surgery cases + 4 follow-up cases + OT record sheet minimum 8 cases (4 major and 4 minor) + Basic suturing, Incision & drainage of superficial abscess skill to be performed independently and to get it certified.

4th Clinical Posting (4 weeks) = 4 General Surgery cases + 2 follow-up cases + OT record sheet minimum 6 cases (2 major and 4 minor) + Early management of trauma skill to be performed independently and to get it certified + Demonstrates trauma life support

POSTING CERTIFICATE

Name: - Year of Admission: -

Year of appearing for Final M.B.B.S _____

TERM	From	To	Absent days	Case Histories Written	Remark	Signature of Unit Head
Gen Surgery I (4 weeks)						
Gen Surgery II (4 weeks)						
Gen Surgery III (8 weeks)						
Gen Surgery IV (4 weeks)						
Casualty (1week)						

N.B: - 1. Students must get the signature of the Unit In charge when posting is completed.

2. This certificate must be submitted before every Internal assessment & Preliminary. examination.

3. Completed record is mandatory for appearing for the Final Examination.

Template for Clinical Cases and Operative Notes

Name of Patient Age/Sex Ward no.

MRD No Head of the Unit

Occupation

Religion

Address

Date of admission Date of Discharge

Chief complaints

HOPI/ODP

Past H/O

Personal H/O

Family H/O

Menstrual History in females

Obstetrical History in females**General examination**

Built & Nourishment
Level of consciousness
Temperature.
Pulse rate
Respiratory rate
Blood Pressure
Pallor/ cyanosis/clubbing/oedema/Lymphadenopathy/ Icterus

Local examination:

Inspection

Palpation

Percussion

Auscultation

Systemic Examination:

CVS

RS

CNS

PA

Provisional Diagnosis

Differential Diagnosis

Investigations

Hematological

Biochemical

Radiological

Xray -
USG -
CT -
MRI -

Final Diagnosis

Treatment-

Plan

Pre-operative Workup

Template forOperative Notes

Date: -Time: - Surgeon: -

Indication And operation: The working Diagnosis on which the procedure was based and the name of the operation.

Type of Anesthesia: -

Position of patient: - Describe the position and precautions taken to avoid complications.

Incision: - Name the incision, shape and length including any extensile exposure. A drawing may be useful.

Findings: Describe what was found. List structures identified and protected.

Procedure: Report what was exactly done. Describe prosthetics or special instruments used.

Closure: Washout, Hemostasis and drains, Method used for closure and Dressing

Post-operative care: Clear instructions with frequency on (a) general observations, (b) Checks on function, (c) Wound care, (d) removal of drains, (e) Start of mobilization, (f) removal of stitches, (g) discharge, (h) follow up.

Complications: List of potential complications and actions to be taken under a 'What If' list

Specimen sent for Histopathology Examination: Yes/No

Histopathology report:

Daily progress note:

Post-Op Progress Report -

(To be filled everyday in serious cases and every third day in other. Mention observations pertaining to a case, any special investigations done and daily treatment administered)

Day (Post-op)	Gen. condition (Appearance, Pulse, BP, Temp Chest)	Fluid intake	Fluid Output			Complications- If any and their treatment and investigation
			Urine	Suction	Others	

Condition of Patient on discharge: -

Advices on discharge: -

Reflection by students in max. 200 words: -
(Write your overall impression of case at the time of discharge or when you leave the case)

Feedback by Faculty –

Signature by Student and Faculty: -

Operative Notes

Date: - Time: - Surgeon: -

Indication And operation:

Type of Anesthesia: -

Position of patient: -

Incision: -

Findings:

Procedure:

Closure:

Post-operative care

Complications:

Specimen sent for Histopathology Examination: Yes/No

Histopathology report:

Progress Report -

(To be filled everyday in serious cases and every third day in other. Mention observations pertaining to a case, any special investigations done and daily treatment administered)

Day (Post-op)	Gen. condition (Appearance, Pulse, BP, Temp Chest)	Fluid intake	Fluid Output			Complications- If any and their treatment and investigation
			Urine	Suction	Others	

Condition of Patient on discharge: -

Advices on discharge: -

PHASE-II INDEX OF THE CASE HISTORIES OF GENERAL SURGERY CASES AND FOLLOW UP CASES

(minimum 4 General surgery cases + 2 Follow-up cases)

Sr. No	Name of The Patient	Date	Diagnosis	Ward no.	Page No.	Signature of Faculty
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						

Case 1:

Case 2:

Case 3:

Case 4:

Case 5:

Case 6:

Case 7:

Case 8:

INDEX OF THE OPERATIVE PROCEDURES PHASE II

[OT record sheet minimum 6 cases (2 major and 4 minor) +Asepsis, Basic bandaging skill performed independently.]

Sr. no.	Name of the patient	Date	Diagnosis	Operative Procedures	Page No.	Signature of Faculty
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						

Case 1:

Case 2:

Case 3:

Case 4:

Case 5:

Case 6:

Case 7:

Case 8:

PHASE-III/I INDEX OF THE CASE HISTORIES OF GENERAL SURGERY CASES AND FOLLOW UP CASES

(minimum 4Generalsurgerycases+ 2follow-up cases)

Sr. No	Name of The Patient	Date	Diagnosis	Ward no.	Page No.	Signature of Faculty
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						

Case 1:

Case 2:

Case 3:

Case 4:

Case 5:

Case 6:

Case 7:

Case 8:

INDEX OF THE OPERATIVE PROCEDURES PHASE III/I

[OT record sheet minimum 6 cases (2 major and 4 minor) + Basic wound care skill performed independently]

Sr. no.	Name of the patient	Date	Diagnosis	Operative Procedures	Page No.	Signature of Faculty
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						

Case 1:

Case 2:

Case 3:

Case 4:

Case 5:

Case 6:

Case 7:

Case 8:

PHASE-III/II INDEX OF THE CASE HISTORIES OF GENERAL SURGERY CASES AND FOLLOW UP CASES

[3rd Clinical Posting minimum 10 General Surgery cases + 4 follow-up cases & 4th Clinical Posting minimum 4 General Surgery cases + 2 follow-up cases]

Sr. No	Name of The Patient	Date	Diagnosis	Ward no.	Page No.	Signature of Faculty
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						
11.						
12.						
13.						
14.						

15.						
16.						
17.						
18.						
19.						
20.						
21.						
22.						
23.						
24.						

Case 1:

Case 2:

Case 3:

Case 4:

Case 5:

Case 6:

Case 7:

Case 8:

Case 9:

Case 10:

Case 11:

Case 12:

Case 13:

Case 14:

Case 15:

Case 16:

Case 17:

Case 18:

Case 19:

Case 20:

Case 21:

Case 22:

Case 23:

Case 24:

INDEX OF THE OPERATIVE PROCEDURES PHASE III/II

[OT record sheet minimum 14 cases (6 major and 8 minor) + Basic suturing, Incision & drainage of superficial abscess, early management of trauma skills & demonstrates trauma life support]

Sr. no.	Name of the patient	Date	Diagnosis	Operative Procedures	Page No.	Signature of Faculty
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						
11.						
12.						

13.						
14.						
15.						
16.						

Case 1:

Case 2:

Case 3:

Case 4:

Case 5:

Case 6:

Case 7:

Case 8:

Case 9:

Case 10:

Case 11:

Case 12:

Case 13:

Case 14:

Case 15:

Case 16:

ANNEXURE 1

Paper wise distribution of topics for Prelim & MUHS Annual Examination
Year: **III-II MBBS** Subject: **_General Surgery and allied**

Paper	Section	Topics
I	A	MCQs on all topics of paper I of Surgery
	B	Metabolic response to injury, Shock, Blood and blood components, Burns, Wound healing and wound care, Surgical infections, Surgical Audit and Research, Nutrition and fluid therapy, Transplantation, Biohazard disposal, Trauma,Skin and subcutaneous tissue, Developmental anomalies of face, mouth and jaws, Oropharyngeal cancer,Disorders of salivary glands, Endocrine General Surgery: Thyroid and parathyroid, Adrenal glands, Breast, Vascular diseases, Ethics &AETCOM(module 4.3,4.5,4.6)
	C	Abdomen- including Hernia, Peritoneum, GIT tract including esophagus, stomach, small intestine, colon rectum and anal canal, Liver , Spleen, Pancreas, Biliary tract ,Minimally invasive Surgery, Pediatric surgery
II	A	MCQs on all topics of the paper II including orthopaedics, anaesthesia, radiology and dentistry .
	B	Cardio-thoracic - Chest - Heart and Lungs,Urinary System- Kidney ureter and urinary bladder , Penis, Testis and scrotum, Plastic surgery, Oncology,Investigation of surgical patient, Pre, intra and post- operative pain management management and Anesthesia, Radiology,
	C	Orthopedics ,

Annexure 2

Recommended books

Year: II/ III-I/ III-II MBBS
Subject: General Surgery

Sr.no.	Author	Title of book/ Material	Publisher
		TEXTBOOK	
1.	Norman S Williams P. Ronan O'Connell Andrew McCasksie	Bailey & Love's Short practice of Surgery 27th Edition 2018	CRC Press
2	Sriram Bhat	SRB's Manual of Surgery 6th Edition 2017	Jaypee Publishers
3	K Rajgopal Shenoy Anitha Shenoy	Manipal Manual of Surgery 5th Edition 2020	CBS Publishers
4	S Das	A Concise Textbook of Surgery 6th Edition 2018	DAS Publications
		CLINICAL SURGERY	
1.	S Das	A Manual on Clinical Surgery 9th Edition 2019	DAS Publications
2.	Sriram Bhat	SRB's Bedside Clinics in Surgery 1st Edition 2009	Jaypee Publishers
3.	Makhan Lal Saha	Bedside Clinics in Surgery 2nd Edition 2013	Jaypee Publishers
4.	J Kyle, JAK Smith, D Johnson	Pye's Surgical Handicraft 22nd Edition 1999	K. M. Vargheese Company (Indian edition)
5.	Margaret Farquharson, James Hollingshead, Brendan Moran	Farquharson's Textbook of Operative General Surgery 10th Edition 2015	CRC Press
6.	John S P Lumley, Anil K D'Cruz, Carol E Scott-Conner	Hamilton Bailey's Demonstration of Physical signs in Clinical Surgery 19th Edition 2014	CRC Press

		REFERENCES	
1.	Courteny Townsend, Daniel Beauchamp, B Mark Evers, Kenneth L Mattox	Sabiston Textbook of Surgery 1st South Asia Edition 2017	Elseiver
2.	F Charles Brunicardi, Mary L Brandt, Dana Anderson, Timothy Billar, David Dunn, John Hunter, Jeffery Matthews, Raphael Polllock	Schwartz's Principles of Surgery 10th Edition 2019	McGraw Hill
		APPLIED ANATOMY	
1.	Lee McGregor GAG Decker, DJ du Plessis	Lee McGregor's Synopsis of Surgical Anatomy 12th Edition 2018	K M Varghese Company
2.	John E Skandalkis, Gene Colborn, Thomas Weidman	Skandalkis Surgical Anatomy 2004	Broken hill Publishers
3.	Chummi S. Sinnatamby	Last's Anatomy Regional and Applied 12th Edition 2011	Churchill Livingstone
		PATHOLOGY	
1.	Kumar, Abbas, Aster	Robbin's Pathologic Basis of Disease 10th Edition, 2020	Elsiever
2.	Harsh Mohan	Textbook Of Pathology 8th Edition, 2018	Jaypee Publishers

		PHYSIOLOGY	
1.	Joh E Hall	Guyton and Hall Textbook of Medical Physiology 14th Edition 2020	Elsevier
2.	Kim E Barrett, Susan M. Barman, Heddwen L. Brooks, Jason Yuan	Ganong's Review of Medical Physiology 24thEdition 2019	Lange

****For Syllabus refer to MUHS Website**

Name of the Institute

LOG BOOK

DEPARTMENT OF GENERAL SURGERY

Sayings of the great:

To study the phenomenon of disease without books is to sail an uncharted sea, while to study books without patients is not to go to sea at all.

-Sir William Osler

The good physician treats the disease, the great physician treats the patient who has the disease.

-Sir William Osler

Observe, record, tabulate, communicate. Use your five senses. Learn to see, learn to hear, learn to feel, learn to smell and know that by practice alone you can become expert.

-Sir William Osler

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4	RECORD OF INTERNAL ASSESSMENT EXAMINATIONS	08
5	SELF DIRECTED LEARNING / TUTORIALS / SEMINARS / EXTRA CURRICULAR ACTIVITIES	09
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7	PSYCHOMOTOR SKILLS – LIST OF COMPETENCIES	14
8	COMMUNICATION SKILLS – AETCOM	16
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11	PHASE III/II	26
12	REFLECTION ON AETCOM MODULE	30
13	ANNEXURES	32

LOGBOOK CERTIFICATE

This is to certify that this logbook is the bonafide record of Mr. / Ms. ..... Roll No……..Admission Year ……., of the Department of General Surgery at …….Medical College.

The logbook is as per the guidelines of Competency Based Undergraduate Medical Education Curriculum, Graduate Medical Regulation 2019.

He / She has satisfactorily attended/ completed all assignments mentioned in this logbook as per the guidelines prescribed by National Medical Commission.

_____

Head of Department of General Surgery

Signature with Date

BIODATA OF THE CANDIDATE

PHOTO

Name of the student:

Name of the course: MBBS

Date of birth:

Father's / Guardian's name:

Mother's name:

Blood group:

Permanent Address: Temporary Address:

…… ……

…… ……..

Student's contact no:

Father's/ Guardian's contact no:

Student's Email id:

Father's/ Guardian's Email id:

Candidates Signature: …….. Date: .....

GENERAL INSTRUCTIONS

1) The logbook is a record of the academic / non-academic activities of the student. Each Medical student is responsible for maintaining their logbook.

2) This logbook is prepared as per the guidelines of NMC for implementation of Competency Based Curriculum for 4TH Professional MBBS students in the subject of General Surgery.

3) Students are instructed to keep their logbook entries up to date. It is the responsibility of the student to enter their activity in respective pages & get them duly signed by the supervising faculty.

4) Entries in the logbook will be in accordance with activities done in the department & have to be scrutinized by the Head of the department.

5) The logbook assessment will be based on multiple factors like
   - Overall presentation
   - Active participation in the sessions
   - Quality of write up of reflections.
   - Timely completions
   - Attendance

6) The logbook shall be kept as record work of the candidate for the department & be submitted to department as a bonafide record of the candidate before appearing for the University examination.

NOTE:

1. A **clear record** of all components that add to the internal assessment marks needs to be maintained by the institution and retained by them for at least **2 years** after passing of the examination. Institutions may be asked to provide these details by the University as and when required.

The contents in the logbook are suggested guidelines. The institutions can make **necessary changes as per the needs.**

ATTENDANCE

Every candidate should have attendance not less than 75% of the total classes conducted in theory, practical and clinical jointly in each calendar year calculated from the date of commencement of the term to the last working day as notified by the University in each of the subjects prescribed to be eligible to appear for the university examinations.

For appearing at the University Examination, student should have minimum 75% attendance in each subject.

A candidate lacking in the prescribed attendance in any subject(s) should not be permitted to appear for the examination in that subject(s)

Students cannot appear in part or separately in individual subjects during the first appearance at the Professional examination.

The Principal should notify the attendance details at the end of each professional phase without fail under intimation to this University.

Records of Internal Assessment Examinations

Sr. No.	Exam No.	Date	Theory	Date	Practical including Viva	Feedback provided	Signature of student	Signature of teacher
1	*Phase II		/100		/100			
2	*Phase III/I		/100		/100			
3	Phase III/II		/300		/300			
4	Total		/500		/500			
5	Conversion		/100		/100			
6	Final Internal Assessment Marks (to be submitted to University)		/100		/100			

[Orthopedics 25 marks, Anesthesia 10marks, Radiodiagnosis & Radiotherapy 10 marks, Dentistry 5 marks to be submitted to department of general surgery during respective phase of teaching.]

.....

Signature of Head of the Department

Self-Directed Learning, Seminars, Tutorials, Projects, Quizzes, extracurricular activities

Sr. No.	Self- directed learning (Seminars, Tutorials, Projects, Quizzes, Extracurricular activities)	Date	Phase III/I	Phase III/II	Signature of Teacher

Reflection (minimum 200 words) – 1 **Date :**

TOPIC:

Reflection (minimum 200 words) – 2

Date :

TOPIC:

LOGBOOK CLINICAL SKILLS : LIST OF COMPETENCIES

Clinical skills can be assessed by case presentation, case-based discussion, objective structured clinical assessment the checklist, MiniCex, as per the institutional preference.

Competency # addressed	**Name of Activity**
SU3.2	Observe blood transfusions.
SU5.2	Elicit, document and present a history in a patient presenting with wounds.
SU18.3	Describe and demonstrate the clinical examination of surgical patient including swelling and order relevant investigation for diagnosis. Describe and discuss appropriate treatment plan
SU22.3	Demonstrate and document the correct clinical examination of thyroid swellings and discus the differential diagnosis and their management
SU *24.3	Describe the principles of investigation and management of pancreatic disorders including pancreatitis and endocrine tumors
SU 25.5	Demonstrate the correct technique to palpate the breast for breast swelling in a mannequin or equivalent
SU 27.2	Demonstrate the correct examination of the vascular system and enumerate and describe the investigation of vascular disease
SU 27.6 *	Describe pathophysiology, clinical features, investigations and management of DVT and varicose veins.

SU27.8	Demonstrate the correct examination of the lymphatic system
SU28.2	Demonstrate the correct technique to examine the patient with hernia and identify different types of hernias.
SU 28.8 & SU28.9	Demonstrate the correct technique of examination of a patwith disorders of the stomach
SU28.18	Describe and demonstrate clinical examination of abdomen. Order relevant investigations. Describe and discuss appropriate treatment plan
SU 29.9*	Describe the clinical features, investigations and management of disorders of prostate
SU 30.1*	Describe the clinical features, investigations and principles of management of phimosis, paraphimosis and carcinoma penis.
SU 30.2*	Describe the applied anatomy, clinical features, investigations and principles of management of undescended testis
SU 30.3*	Describe the applied anatomy, clinical features, investigations and principles of management of epididymo- orchitis
SU 30.4*	Describe the applied anatomy, clinical features, investigations and principles of management of varicocele
SU 30.5*	Describe the applied anatomy, clinical features, investigations and principles of management of hydrocele
SU 30.6*	Describe the applied anatomy, clinical features, investigations and principles of management of tumours of testis

LOGBOOK PSYCHOMOTOR / PERFORMANCE SKILLS:

Skills can be assessed by objective structured clinical assessment with checklist, Global Rating Scale, Simulated patients as per the institutional preference.

Colleges are instructed prepare modules for skill training as per NMC guidelines.

Module 5 Skill Training.

I – independent certification

D- demonstration

LIST OF COMPETENCIES

Competency # addressed	Name of Activity
SU10.4**(I)**	Perform basic surgical skill such as First Aid including suturing and minor surgical procedures in simulated environment
(I)	Bandaging (Head bandaging, Ear bandaging, Eye Bandaging, Figure of 8 Bandaging around joints of upper limb and lower limb, Scrotal support, Crepe bandage application over upper limb and lower limb
(I)	Incision and Drainage
(I)	Wound Care (Clean surgical wound care, Wounds after trauma, Diabetic wound care)
SU11.3**(I)**	Demonstrate maintenance of an airway in a mannequin or equivalent
SU14.4**(I)**	Demonstrate the techniques of asepsis and suturing in simulated environment
SU17.2**(D)**	Demonstrate the steps in Basic Life support, Transport of injured patient in a simulated environment
SU17.10**(D)**	Demonstrate Airway maintenance. Recognize and manage tension pneumothorax, hemothorax and flail chest in simulated environment
S29.11	Demonstrate a digital rectal examination of the prostate in a mannequin or equivalent

LOGBOOK FOR AETCOM SKILLS

Counselling for Investigation, Treatment, Prognosis, Blood donation, Organ Donation, Breaking Bad news. All types of consent. Medicolegal aspects and Ethics, Empathy and professionalism as per the Phase of the MBBS. Include cases of Allied branches also.

Competency to be assessed during Clinical postings and /or small group discussions.

LIST OF COMPETENCIES FOR AETCOM

Competency addressed	Name of Activity
SU2.3	Communicate and counsel patients and families about the treatment and prognosis of shock demonstrating empathy and care.
SU3.3	Counsel patients and family/ friends for blood transfusion and blood donation.
SU4.4	Communicate and counsel patients and families on the outcome and rehabilitation demonstrating empathy and care.
SU9.2	Biological basis for early detection of cancer and multidisciplinary approach in management of cancer
SU9.3	Communicate the results of surgical investigations and counsel the patient appropriately
SU13.4	Counsel patients and relatives on organ donation in a simulated environment
SU25.2	Describe the etiopathogenesis, clinical features and principles of management of benign breast disease including infections of the breast

PHASE II-clinical (minimum four assessments)

Sr. No.	Competency # addressed	Name of Activity	Site Ward, skill lab, opd , casualty,	Date completed	Attempt at activity First (F) Repeat (R) Remedial (Re)	Rating Below (B) expectations Meets (M) expectations Exceeds (E) expectations OR Numerical Score	Decision of faculty Completed (C) Repeat (R) Remedial (Re)	Initial of faculty	Feedback received Initial of Learner	Method of assessment and Score
1.										
2.										
3.										
4.										
5.										
6.										

PHASE II-Psychomotor

Sr. No.	Competency # addressed	Name of Activity	Site Ward, skill lab, opd , casualty,	Date completed	Attempt at activity First (F) Repeat (R) Remedial (Re)	Rating Below (B) expectations Meets (M) expectations Exceeds (E) expectations OR Numerical Score	Decision of faculty Completed (C) Repeat (R) Remedial (Re)	Initial of faculty	Feedback received Initial of Learner	Method of assessment and Score
1.										
2.										
3.										
4.										
5.										

Sr. No.	Competency # addressed	Name of Activity	Site Ward, skill lab, opd , casualty,	Date completed	Attempt at activity First (F) Repeat (R) Remedial (Re)	Rating Below (B) expectations Meets (M) expectations Exceeds (E) expectations OR Numerical Score	Decision of faculty Completed (C) Repeat (R) Remedial (Re)	Initial of faculty	Feedback received Initial of Learner	Method of assessment and Score
6.										
7.										
8.										
9.										
10.										
11.										
12.										

PHASE II- AetCom (Minimum four assessments)

Sr. No.	Competency # addressed	Name of Activity	Site Ward, skill lab, opd , casualty,	Date completed	Attempt at activity First (F) Repeat (R) Remedial (Re)	Rating Below (B) expectations Meets (M) expectations Exceeds (E) expectations OR Numerical Score	Decision of faculty Completed (C) Repeat (R) Remedial (Re)	Initial of faculty	Feedback received Initial of Learner	Method of assessment and Score
1.										
2.										
3.										
4.										
5.										
6.										

PHASE III Part I -clinical (Minimum four assessments)

Sr. No.	Competency # addressed	Name of Activity	Site Ward, skill lab, opd , casualty,	Date completed	Attempt at activity First (F) Repeat (R) Remedial (Re)	Rating Below (B) expectations Meets (M) expectations Exceeds (E) expectations OR Numerical Score	Decision of faculty Completed (C) Repeat (R) Remedial (Re)	Initial of faculty	Feedback received Initial of Learner	Method of assessment and Score
1.										
2.										
3.										
4.										
5.										
6.										

PHASE III Part I-Psychomotor skill

Sr. No.	Competency # addressed	Name of Activity	Site Ward, skill lab, opd , casualty,	Date completed	Attempt at activity First (F) Repeat (R) Remedial (Re)	Rating Below (B) expectations Meets (M) expectations Exceeds (E) expectations OR Numerical Score	Decision of faculty Completed (C) Repeat (R) Remedial (Re)	Initial of faculty	Feedback received Initial of Learner	Method of assessment and Score
1.										
2.										
3.										
4.										
5.										

Sr. No.	Competency # addressed	Name of Activity	Site Ward, skill lab, opd , casualty,	Date completed	Attempt at activity First (F) Repeat (R) Remedial (Re)	Rating Below (B) expectations Meets (M) expectations Exceeds (E) expectations OR Numerical Score	Decision of faculty Completed (C) Repeat (R) Remedial (Re)	Initial of faculty	Feedback received Initial of Learner	Method of assessment and Score
6.										
7.										
8.										
9.										
10.										
11.										
12.										

PHASE III Part I - AetCom (Minimum four assessments)

Sr. No.	Competency # addressed	Name of Activity	Site Ward, skill lab, opd , casualty,	Date completed	Attempt at activity First (F) Repeat (R) Remedial (Re)	Rating Below (B) expectations Meets (M) expectations Exceeds (E) expectations OR Numerical Score	Decision of faculty Completed (C) Repeat (R) Remedial (Re)	Initial of faculty	Feedback received Initial of Learner	Method of assessment and Score
1.										
2.										
3.										
4.										
5.										
6.										

PHASE III Part II -clinical (minimum four assessments)

Sr. No.	Competency # addressed	Name of Activity	Site Ward, skill lab, opd , casualty,	Date completed	Attempt at activity First (F) Repeat (R) Remedial (Re)	Rating Below (B) expectations Meets (M) expectations Exceeds (E) expectations OR Numerical Score	Decision of faculty Completed (C) Repeat (R) Remedial (Re)	Initial of faculty	Feedback received Initial of Learner	Method of assessment and Score
1.										
2.										
3.										
4.										
5.										
6.										

PHASE III Part II -Psychomotor skill

Sr. No.	Competency # addressed	Name of Activity	Site Ward, skill lab, opd , casualty,	Date completed	Attempt at activity First (F) Repeat (R) Remedial (Re)	Rating Below (B) expectations Meets (M) expectations Exceeds (E) expectations OR Numerical Score	Decision of faculty Completed (C) Repeat (R) Remedial (Re)	Initial of faculty	Feedback received Initial of Learner	Method of assessment and Score
1.										
2.										
3.										
4.										
5.										

Sr. No.	Competency # addressed	Name of Activity	Site Ward, skill lab, opd , casualty,	Date completed	Attempt at activity First (F) Repeat (R) Remedial (Re)	Rating Below (B) expectations Meets (M) expectations Exceeds (E) expectations OR Numerical Score	Decision of faculty Completed (C) Repeat (R) Remedial (Re)	Initial of faculty	Feedback received Initial of Learner	Method of assessment and Score
6.										
7.										
8.										
9.										
10.										
11.										
12.										

PHASE III Part II - AetCom (Minimum five assessments)

Sr. No.	Competency # addressed	Name of Activity	Site Ward, skill lab, opd , casualty,	Date completed	Attempt at activity First (F) Repeat (R) Remedial (Re)	Rating Below (B) expectations Meets (M) expectations Exceeds (E) expectations OR Numerical Score	Decision of faculty Completed (C) Repeat (R) Remedial (Re)	Initial of faculty	Feedback received Initial of Learner	Method of assessment and Score
1.										
2.										
3.										
4.										
5.										
6.										
7.										

REFLECTION ON AETCOM MODULE For PHASE III/IIs

Module 4.3 - Case studies in medico-legal and ethical situations

Competency addressed	Level
Identify and discuss medico-legal, socio-economic and ethical issues as it pertains to organ donation	KH

Reflection (minimum 200 words) -1 Date:

Signature of Teacher-in-charge

REFLECTION ON AETCOM MODULE

Module 4.6 - Case studies in ethics and the doctor-industry relationship

Competency addressed	Level
Identify conflicts of interest in patient care and professional relationships and describe the correct response to these conflicts	SH

Reflection (minimum 200 words)-2 Date:

Signature of Teacher-in-charge

ANNEXURE 1:

RECORDING FORM FOR MINI – CEX

EVALUATOR : DATE :

STUDENT :

YEAR :

PATIENT DIAGNOSIS :

SETTINGS :

AMBULATORY	NEW	COMPLEXITY :	LOW
IN PATIENT	FOLLOW UP		MODERATE
ED			HIGH
OTHER :			

PATIENT AGE PATIENT SEX

FOCUS : DATA GATHERING / DIAGNOSIS / THERAPY / COUNSELLING

1. **MEDICAL INTERVIEWING SKILLS** (OBSERVED / NOT OBSERVED)

1 2 3 / 4 5 6 / 7 8 9

2. **PHYSICAL INTERVIEWING SKILLS** (OBSERVED / NOT OBSERVED)

1 2 3 / 4 5 6 / 7 8 9

3. **HUMANISTIC QUALITIES** / PROFFESIONALISM (OBSERVED / NOT OBSERVED)

1 2 3 / 4 5 6 / 7 8 9

4. **CLINICAL JUDGEMENT** (OBSERVED / NOT OBSERVED)

1 2 3 / 4 5 6 / 7 8 9

5. **COUNSELLING SKILLS** (OBSERVED / NOT OBSERVED)

1 2 3 / 4 5 6 / 7 8 9

6. **ORGANIZATION / EFFICIENCY** (OBSERVED / NOT OBSERVED)

1 2 3 / 4 5 6 / 7 8 9

7. **OVERALL CLINICAL COMPETENCE** (OBSERVED / NOT OBSERVED)

1 2 3 / 4 5 6 / 7 8 9

MINI CEX TIME : OBSERVING : _____ MINS

PROVIDING FEEDBACK _____ MINS

UNSATISFACTORY 1,2,3

SATISFACTORY 4, 5, 6

SUPERIOR 7, 8, 9

EVALUATOR SATISFACTION WITH MINI CEX

LOW 1 2 3 4 4 5 6 7 8 9 HIGH

RESIDENT SATISFACTION WITH MINI CEX

LOW 1 2 3 4 4 5 6 7 8 9 HIGH

COMMENTS :

STUDENT SIGNATURE EVALUATOR SIGNATURE

ANNEXURE 2:

AetCom skills can be assessed by use of Kalamazoo consensus.

Criteria
Builds relationship
Opens the discussion
Gathers information
Understands the patient's perspective
Shares information
Manages flow
Overall rating
Signature of teacher

Communication skills rating scale adapted from Kalamazoo consensus statement.

Rating 1-3 - Poor, 4 -6 Satisfactory, 6 -10 Superior

Course Content

Subject: Obstetrics and Gynecology
Lectures

(Based on Medical Council of India, Competency based Undergraduate curriculum for the Indian Medical Graduate, 2018. Vol. 3; page nos. 102-129)

Integration: Upto 20% of the topics are to be taken in integration with other subjects as per directives.

Second MBBS phase II (from October 2020)
Total Teaching hours :
A. Lectures: 25 hours

Serial number	Competency Nos.	Integration	Lecture topics & Subtopics	Hours
1.	OG **2.1**	AN 48.8, 49.1, 49.2, FM 3.18	Anatomy of the female reproductive tract,	1
2.	OG 3.1.		Physiology of menstruation	1
3.	OG 3.1	AN 77.3,77.4	Physiology of gametogenesis, Ovulation, conception, implantation , & reproductive endocrinology	1
4.	OG 4.1	AN 80.3 80.5, 80.6	Early development of embryo and fetus, development of Placenta, amniotic fluid, cord	1
5.	OG 2.1	AN 52. 8, 79.4	Embryology and developmental defects of female genital tract	1
6.	OG 6.1	FM3.19, PY 9.10	Diagnosis of pregnancy	1
7.	OG 7.1	PY 9.8	Physiological changes in pregnancy	1
8.	OG 1.1, 1,2	CM10.1, 10.2	Maternal and perinatal mortality	1
9.	OG- 5.1, 5.2 An		Preconceptional counseling	1

Serial number	Competency Nos.	Integration	Lecture topics & Subtopics	Hours
	75.5			
10.	OG 8.1, 8.2(K), 8.3(K)		Antenatal Care, birth planning, and Obstetric examination	1
11.	OG 8.4, 16.3	AN 75.5	Antenatal screening, genetic counselling and antenatal monitoring of fetal well being	
12.	OG 8.7		Vaccines and medications in pregnancy, Teratology	1
13.	OG 14.1	AN 53.2, 53.3	Fetal skull, pelvis	1
14.	OG 13.1		Labor physiology	1
15.	OG 13.1		Labor mechanism	1
16.	OG 13.1		Management of labor 1st stage with, partogram, intrapartum monitoring of fetal well being and labor analgesia	1
17.	OG 13.1		Management of labor 2nd and third stage	1
18.	OG 19.1		Physiological changes in puerperium, Management of puerperium	1
19.	OG 17.1, 17.2	CM10.3	lactation physiology and management	1
20.	OG 9.5		Hyperemesis , vomiting in pregnancy management	1
21.	1.3, 9.1	AN 78.5	Hemorrhage in early pregnancy (abortions)	1
22.	9.3	AN 78.3	Hemorrhage in early pregnancy (ectopic pregnancy	1
23.	9.4		Hemorrhage in early pregnancy (Molar pregnancy)	1
24.			Recurrent pregnancy loss	1
25.	11.1	AN 80.4	Multifetal pregnancy	1

Third MBBS phase III

Total Teaching hours :

A. Lectures: **25 hours**

Serial number	Competency Nos.	Integration	Topics & Subtopics	Hours
1.	OG 12.1		Hypertensive disorders in pregnancy	1
2.	OG 12.1		Hypertensive disorders in pregnancy	1
3.	OG 13.2		Preterm and PROM	1
4.	OG 13.2		Prolonged pregnancy	1
5.	OG 16.3		Intrauterine growth restriction	1
6.			Disorders of amniotic fluid	1
7.			Abnormalities of placenta . cord	1
8.			Intrauterine fetal death	1
9.	OG 10.1		Antepartum hemorrhage 1 Placenta previa	1
10.	OG 10.1		Antepartum hemorrhage 2 Abruption+ vasa previa	1
11.	**OG 12.8**	PA 22.2	Rh negative pregnancy	1
12.	OG 12.2		Anemia (Iron deficiency + Megaloblastic)	1
13.	OG 12.2		Anemia (Others)	1
14.	OG 12.4		Heart disease in pregnancy	1
15.	**OG 12.3**		Diabetes in pregnancy	1
16.	OG 12.5		Infections in pregnancy UTI,(Incl Malaria etc)	1
17.	OG 12.6		Hepatic disorders in pregnancy	1
18.			Thyroid disorders in pregnancy	1
19.			Respiratory disorders in pregnancy including TB, COVID, Flu	1
20.			Viral infections in pregnancy (Viral)	1
21.	OG 12.7 ,27.3		HIV in Obstetrics and Gynecology	1
22.			Gynecological disorders in pregnancy	1
23.			Surgical disorders in pregnancy	1

Serial number	Competency Nos.	Integration	Topics & Subtopics	Hours
24.		CM 10.4	National Health programs-I safemotherhood, reproductive and child health	1
25.			National Health programs-II Respectful maternity care, Laqshya guidelines	1

Third MBBS phase IV

Total Teaching hours :

A. Lectures: **70 hours**

Serial number	Competency Nos.	Integration	Topics & Subtopics	Hours
1.	OG 14.4	FM 3.21	Malpositions: Occipito posterior presentation + DTA	1
2.	OG 14.4		Face, Brow Mechanism of labor in each	1
3.	OG 14.4		Malpresentations Breech	1
4.	OG 14.4		Unstable lie (Transverse/ oblique)	1
5.		AN 79.5,	Congenital anomalies of fetus	1
6.			Shoulder dystocia	1
7.	OG 14.4		Abnormal labor,classification, diagnosis and management.	1
8.	OG 14.1		Types of pelvis, Contracted pelvis, cephalopelvic disproportion	1
9.	OG 14.2		Obstructed labor, Rupture uterus causes, diagnosis and management .	1
10.	OG 15.1		Instrumental vaginal deliveries+ Ref to destructive operations	1
11.	OG 15.1		Cesarean section	1
12.			Pregnancy with previous cesarean section .	1
13.	OG 16.1		Third stage complications PPH	1
14.	OG 16,2		Third stage complications- inversion of uterus, Injuries to birth canal	1

15.	OG 19.1,17.3		Disorders of puerperium	1
16.	OG 13.1		Induction of labor,	1
17.	OG 13.1		Obstetric analgesia	1
18.	23.1		Physiology of Puberty and Abnormal puberty	1
19.	23.2, 23.3		Delayed puberty, precocious puberty	1
20.			Disorders of sexual development	1
21.	OG 23.1		Menstruation and common complaints (Dymenorrhea+ PMDD)	1
22.	OG 24.1, PA 30.9	PA 30.9	Abnormal uterine Bleeding Endometrial polyps , hyperplasia	1
23.	25.1		Amenorhea: Primary/ secondary	1
24.	OG 32.1	PY 9.11	Menopause & management , premature ovarian failure	1
25.	OG 22.1, 22.2	PA 30.6	Leucorrhea , cervical erosion, Cervicitis, vaginitis syndromic management	1
26.	OG 27.1,27.4		PID, Chronic pelvic pain ,	1
27.	27.2		Genital tuberculosis	1
28.	OG 30.1, 30.2		PCOS	1
29.	OG 28.1, 28.2	PY 9.12	Infertilty-Cervical & Uterine & Tubal Factors	1
30.	OG 28.3	PH 1.40	Infertilty- Ovulation Factors, Endocrine Factors, Galactorrhoea, Hirsuitism	1
31.	OG 28.4		ART in infertility	1
32.	OG 28.1		Infertility- Male & Unexplained	1
33.	OG 29.1		Benign tumors: Leiomyoma and polyps	1
34.	Pa 30.7. 30.8, OG 26.1	PA 30.7, 30.8	Endometriosis and adenomyosis	1
35.	OG 31.1		Displacements of uterus	1
36.			Urinary incontinence	1
37.	OG 26.2		Genitourinary fistulae	1

38.	26.2		Old healed perineal tear and rectovaginal fistula	1
39.	OG 33.2		Premalignant lesions of the female genital tract , Cervical intraepithelial neoplasia	1
40.	OG 33.3, 33.4		Screening and early detection of women's cancers including breast cancer	1
41.	OG 33.1	PA 30.1	Invasive cervical cancer	1
42.	OG 32.2		Approach to a patient of Post menopausal bleeding,	1
43.	OG 34.1	PA 30.2, PA 30.3	Uterine cancers	1
44.			Benign and malignant Lesions of vulva and vagina	1
45.	OG 34.3	PA 30.5	Gestational trophoblastic neoplasia	1
46.	OG 34,2		Benign ovarian tumors+ including non neoplastic enlargements of ovary	1
47.	OG 34.2	PA 30.4	Malignant ovarian tumors	1
48.		BI 10.2	Principles of Chemotherapy and Radiotherapy in Gynecology	1
49.	21.1		Contraception: male and female barrier methods	1
50.	21.1	PH 1.39	Hormonal contraception	1
51.	21.2		IUDs, PPIUCD program	1
52.	21.1		Female sterilization, postpartum sterlization	1
53.	21.1		Reversal of sterilization male and female	1
54.	21.1		Contracepton in special populations	1
55.	OG 20.1		MTP:Act, first trimester procedures	1
56.	OG 20.2		MTP second trimester procedures	1
57.	18.1, 18.3		Neonatal Asphyxia , , convulsions in the newborn	1
58.			Neonatal resuscitation	1
59.			Neonatal Jaundice + Birth injuries	1
60.	OG 8.8		Imaging in Obstetrics	1
61.			Imaging in gynecology	1
62.		PH 1.41	Pharmacotherapeutics in obstetrics	1
63.			Principles of gyn-surgical care- (pre op)	1

64.			Principles of gyn surgical care-(post op)	1
65.	OG 10.2		Critical care in Obstetrics , appropriate use of blood and blood products, their complication and management	1
66.	20.3	FM 3.13-17	PC PNDT act	1
67.		FM 3.13-17	Examination of the sexual assault survivor	1
68.			Domestic Violence act and role of gynecologist Gender	1
69.			Medicolegal issues related to Obstetrics and gynecology	1
70.			Adoption acts	1

Course Content

Subject: Obstetrics and gynecology Gyn skills

Clinical Postings: phase II 4 weeks – (Mon-Fri)
phase III-1 4 weeks – (Mon-sat)
phase III-2 12 weeks – (Mon-sat)

Competency Nos.	skill	topic	Suggested Teaching learning method	Hours	Student should complete this skill by end of mentioned phase
Phase II					
OG35.1	Obtain a logical sequence of history, and perform a humane and thorough clinical examination, excluding internal examinations (per rectal and per-vaginal) K/S SH	History taking in obstetrics	Bed side clinics	15 hours(1 week)	II
OG35.5	Determine gestational age, EDD and obstetric formula K/S SH				
OG35.7	Obtain informed consent for any examination / procedure S SH	Informed consent for examination			
OG35.2.	Arrive at a logical provisional diagnosis after examination K/S SH	obstetric examination and provisional diagnosis	Mannequin/demonstration on patient		
OG36.2	Organise antenatal clinics K/S KH	Antenatal clinic, (set up of OPD) Routine antenatal invesigations, Antenatal care	OPD tour, Demonstration of the set up and how OPD functioning is carried out	3 hrs	II

OG8.6	Assess and counsel a patient in a simulated environment regarding appropriate nutrition in pregnancy K/S SH	Nutritional counselling in pregnancy	Case based learning.	3 hrs	II
OG 35.12	History taking in gynecology, demonstrate P/S, P/V examination		Bed side clinic /OPD demonstration, skill lab for PS PV practice	3 hrs	II
OG8.5	Describe and demonstrate pelvic assessment in a model K/S SH	Maternal pelvis Pelvic assessment Fetal skull	Model,	3 hrs	II
OG8.4	Describe and demonstrate clinical monitoring of maternal and fetal well-being K/S SH	Antepartum monitoring of fetal well being- screening, USG doppler, NST, BPP,	Demonstration	3 hrs	II
OG13.4	Demonstrate the stages of normal labor in a simulated environment / mannequin	Mechanism of labor Management of Labor stage 1 Intrapartum monitoring of fetal well being- Partogram, CTG	Skill lab Models and mannequins Labor room demonstrations	15 hrs	II
OG35.13	Demonstrate the correct technique to perform artificial rupture of membranes in a simulated / supervised environment S SH	ARM			
OG35.14	Demonstrate the correct technique to perform and suture episiotomies in a simulated/ supervised environment S SH	Management of labor stage 2- Episiotomy			

OG35.16	Diagnose and provide emergency management postpartum hemorrhage in a simulated / guided environment K/S SH	Manage ment of labor stage 3 Emergency management of PPH oxytocics			
	Conduction of 2 exams and feedback			15 hours	
			Phase 2 clinical posting Total	**60 hours(4 weeks mon -fri)**	
Phase III-1					
OG37.6	Observe and assist in the performance of outlet forceps application of vacuum and breech delivery K/S/A/C SH	Forceps and vaccum, breech delivery	Mannequins and models skill lab	3 hrs 3 hrs	III-1
OG36.2	Organise postnatal and well-baby clinics K/S KH	Post natal clinic and well baby clinic. PNC case Normal and abnormal Puerperium,	OPD visit Bed side clinics, case based learning	3 hrs 3 hrs 3 hrs	III-1
OG17.2	Counsel in a simulated environment, care of the breast, importance and the technique of breast feeding S/A/C SH	Breast care, technique of breast feeding	Bed side clinic	3 hrs	III-1
OG35.17	Demonstrate the correct technique of urinary catheterisation in a simulated/ supervised environment S SH	Female urinary catheterizaion	Mannequin/ demonstration, Video demonstration	1 hr	III-1
OG37.4	Observe and assist in the performance of Dilatation & Curettage (D&C) K/S/A/C SH	Dialation and curettage	OT procedure, video	2 hrs	III-1

			demonstration		
OG37.5	Observe and assist in the performance of Endometrial aspiration - endocervical curettage (EA-ECC) K/S/A/C SH	Endometrial and endocervical curettage	OT procedure, video demonstration	3 hrs	III-1
OG36.1	Plan and institute a line of treatment, which is need based, cost effective and appropriate for common conditions taking into consideration (a) Patient (b) Disease (c) Socio-economic status (d) Institution/ Governmental guidelines. K/S SH	Cost effective approach	Case based learning	3 hrs	III-1
OG35.4	Demonstrate interpersonal and communication skills befitting a physician in order to discuss illness and its outcome with patient and family A/C SH	Doctor patient communication	Role play, OPD visit	3 hrs	III-1
OG35.6	Demonstrate ethical behavior in all aspects of medical practice. A/C SH	Ethics in medical practise	Case based learning	3 hrs	III-1
OG35.10	Write a proper referral note to secondary or tertiary centres or to other physicians with all necessary details. S SH	Referral note	Case based learning	3 hrs	III-1
OG38.4	Assess the need for and issue proper medical certificates to patients for various purposes K/S/A/C KH	Issue Medical certificates	Case based learning	3 hrs	III-1
		Cover 6 cases mentioned in III-2		18 hrs	
	Conduction of 2 exams and feedback			15 hours	
			Phase III-1 clinical posting Total	**72 hours(4 weeks -mon - sat)**	
Phase III-2					
	Revision of all topics in phase II			**45 hrs**	

	Revision of topic 14, 15 from phase III-1			**15 hrs**	
	Obtain history and on basis of examination findings(internal examination excluded) arrive at a logical provisional diagnosis for type of abortion	Abortions	**Case based learning**	**3 hrs**	
OG35.8	Write a complete case record with all necessary details S SH	Case record-…..10 cases over 3 phases, anemia. Drugs used in anemia Preeclampsia, Antihypertensives in prgnancy Eclampsia ,anticonvulsants in pregnancy IUGR,fetal well being tests Multifetal gestation, Breech, prev caesarean, preterm, tocolytics Prolonged labor induction of labor and drugs used in induction	Bed side clinics/ case based learning	3 hrs 3 hrs 3 hrs 3 hrs 3 hrs 3 hrs 3 hrs 3 hrs 6 hrs	III-1, III-2
OG35.16	Diagnose and provide emergency management of antepartum in a simulated / guided environment K/S	placenta previa case	Bed side clinics/ case	6 hrs	III-1/2

	SH	abruptio placentae case Emergency management of APH with placenta previa case	based learning		
OG35.11	Demonstrate the correct use of appropriate universal precautions for self-protection against HIV and hepatitis and counsel patients S SH	HIV in pregnancy Universal precaution, PPTCT, counselling in HIV	Case based learning Demonstration PPTCT centre visit	3 hrs 3hrs	III-2
OG35.3	Recognize situations, which call for urgent or early treatment at secondary and tertiary centres and make a prompt referral of such patients after giving first aid or emergency treatment. K/S SH	Identifying a high risk pregnancy	Case based learning	3 hrs	III-2
OG13.5	Observe and assist the conduct of a normal vaginal delivery S P	Normal vaginal delivery-2 cases in log book	Labor room	6 hrs	III-2
OG37.1	Observe and assist in the performance of a Caesarean section K/S/A/C SH	Caesarean section	OT procedure/ video demonstration	3 hrs	III-2
OG35.9	Write a proper discharge summary with all relevant information S SH	Discharge summary..VD, CS, gyne case	Case based learning	3 hrs	III-2
OG35.12	Obtain a PAP smear in a stimulated environment S SH	PAP smear	Cancer detection OPD/ video demonstration	3 hrs	III-2
OG36.3	Demonstrate the correct technique of punch biopsy of uterus in a simulated/ supervised environment S SH	Cervical biopsy			III-2
OG33.3	Describe and demonstrate the screening for cervical cancer in a simulated environment K/S SH	Cervical cancer screening, VIA, VILI, Colposcopy			III-2
OG35.15	Demonstrate the correct technique to insert and remove	Contraception	Mannequin/	6 hrs	III-2

	an IUD in a simulated/ supervised environment S SH	methods, Intrauterine contraceptive device insertion and removal	video demonstration/ demonstration small group		
OG13.4	counsel on methods of safe abortion.	Counselling for safe abortion		3 hrs	III-2
OG20.2	In a simulated environment administer informed consent to a person wishing to undergo Medical Termination of Pregnancy S/A/C SH	Informed consent for MTP, MTP act, forms to be filled	Demonstration OT procedure	3 hrs	III-2
OG37.7	Observe and assist in the performance of MTP in the first trimester and evacuation in incomplete abortion K/S/A/C SH	Suction and evacuation(spontaneous abortion , first trimester MTP)			III-2
OG38.3	Lap sterilization K/S/A/C KH	Lap sterilization- 1 case of sterilization	OT procedure/ video demonstration	3 hrs	III-2
OG19.2	Counsel in a simulated environment, contraception and puerperal sterilisation S/A/C SH	Counselling for contraception sterilization. Puerperal sterilization(case based lerning)	Case based learning Family welfare clinic	3 hrs	III-2
OG36.2	Organise family welfare clinics K/S KH	Family welfare clinic			III-2
OG 35.12	History taking in gynecology, Reaching a provisional diagnosis	Gynecology case Vaginitis Fibroid uterus Genital prolapse Infertility	Case based learning	 3 hrs 3 hrs 3 hrs 3 hrs	II

		Adenexal mass Abnormal uterine bleeding(O) Post menopausal bleeding Cancer cervix		3 hrs 3 hrs 3 hrs 3 hrs	
OG37.2	Observe and assist in the performance of Laparotomy K/S/A/C SH	Exploratory laparotomy	OT procedure/ video demonstration	3 hrs	III-2
OG37.3	Observe and assist in the performance of Hysterectomy – abdominal/vaginal K/S/A/C SH	Vaginal hysterectomy, abdominal hysterectomy	OT procedure/ video demonstration	6 hrs	III-2
OG38.1	Laparoscopy K/S/A/C KH	laparoscopy	OT procedure/ video demonstration	3 hrs	III-2
OG38.2	Hysteroscopy K/S/A/C KH	hysteroscopy	OT procedure/ video demonstration	3 hrs	III-2
		Revision drugs in obstetrics and gynecology		3 hrs	

		Revision instruments		3 hrs	
		Revision contraception		3 hrs	
		specimen		3hrs	
OG18.2	Demonstrate the steps of neonatal resuscitation in a simulated environment S SH	Neonatal resuscitation			paeds
		Conduction of exams and feedback And miscellaneous		**24 hrs**	
		Phase III-2 clinical posting Total		**216 hrs(12 weeks mon-sat)**	

Course Content

Subject: Obstetrics and Gynecology

(Based on Indian Gazette on CBME and Medical Council of India, Competency based Undergraduate curriculum for the Indian Medical Graduate, 2018. Vol. 3; page nos. 102-129)

Self directed learning(SDL)

Medical council directs to dedicate 5 hrs in third phase part 1 and 15 hrs in third phase part2 for self directed learning in OBGY.

University leaves it to the discretion of institute to plan the SDL using various methods in which students should be briefed about topic, guided towards learning resources, curiosity, innovation, motivation, competitiveness should be inculcated.
Life long learning capacity should be built.

The record of these SDL sessions should be included in Logbook as reflections of the session .

Small group teaching/tutorials

Medical council directs to dedicate 35 hrs in third phase part 1 and 125 hrs in third phase part2 for small group teaching/tutorials/ integrated teaching/ seminars in OBGY.

Suggested topics:
Dummy Pelvis 4
Obst specimens 4
Gynec specimens 4
X-rays & HSG 2
NST/ CTG 2
Obst Instruments 3
Gynec Instruments 4
Forceps 1
Vacuum 1
Partograph 2
NST, CTG 2
Drugs in obstetrics 3
Gynec drug 2
Contraception 4
Sterilization 2
Minor procedures 2

Apart from this SGT, can comprise of MCQ solving, group seminars, poster making, skit making,

Guidelines for Electives:

Medical council directs to dedicate 2 months of elective postingbetween third phase part 1 and part2

1. Each college can put up department wise lists of electives depending on facilities n resources available.
2. Electives modules should be designed well in advance with mention on specific learning objectives, daily work record, report amd assessment of the same.
3. Allotment of electives will be merit based on combined marks of previous 3 yrs.
4. Medical college can have MOU with other hospitals or centers for elective courses to student.
5. Student can opt for doing elective in any other hospital, city or abroad, provided facility of subject of interest is not available in his/her college, with prior permission of institute.
6. If opting for elective abroad then one month can be contact program and another month will be online program as for one month of elective student is supposed to attend clinical posting also.
7. Only 10% students will be allowed per subject for outside elective.
8. Student will have to apply to centre where he desires to do elective well in advance, application must go through concerned dept n through institute. The centre where student is doing elective must be government or semi government or teaching institute or center affiliated by university or National association of that subject of country.
9. Responsibility of applying, getting admission, expenses incurred for tuition fees n travel n stay will have to take care of by student.
10. At the end of electives Student should produce certificate of completing elective term from head of the institution or centre.

AETCOM

Medical council directs to dedicate 28 hrs + 16 hrs SDL in third phase part 2 for AETCOM. Out of these each subject gets 7 hours + 4 hrs SDL

As decided by university OBGY department will cover module 4.2 and 4.7 out of 9 modules mentioned in AETCOM booklet for phase III part 2.

Internal Assessment

Obst. & Gynaec.

Applicable w.e.f August 2019 onwards examination for batches admitted from June 2019 onwards

Phase	IA – 1 -Exam			IA – 2 -Exam		
	Theory (January)	Practical EOP	Total Marks	Theory (May)	Practical	Total Marks
Second MBBS	50	50	100	50	50	100

Phase	IA – 3 Exam			IA – 4 - Exam		
	Theory (January)	Practical EOP	Total Marks	Theory (April)	Practical	Total Marks
Third MBBS Part I	50	50	100	50	50	100

Phase	IA – 5 - Exam			Prelim Examination		
	Theory (May)	Practical EOP (after 8 weeks posting)	Total Marks	Theory (November)	Practical	Total Marks
Third MBBS Part I	100	100	200	100 x 2 papers = 200	200	400

Internal Assessment Practical Examinations
II MBBS

Internal Assessment - 1

OBGY

Subject: OBGY Practical (IA – 1)					
Spotting	OSCE 1	OSCE 2	Viva	Journal & log book	Practical Total
10	10	10	10	10	50

OSCE Stations to include Signs of General examinations, Local examinations, Psychomotor skills and Communication skills.

Subject: OBGY Practical (IA – 2)					
Long Case					
History	Examination	Investigation	Treatment	AETCOM	Practical Total
10	10	10	10	10	50

Subject: OBGY Practical (IA – 3)					
Spotting	OSCE 1	OSCE 2	Viva	Journal & log book	Practical Total
10	10	10	10	10	50

OSCE Stations to include Signs of General examinations, Local examinations, Psychomotor skills and Communication skills.

Subject: OBGY Practical (IA – 4)					
Long Case					
History	Examination	Investigation	Treatment	AETCOM	Practical Total
10	10	10	10	10	50

Subject: OBGY Practical (IA –5)				
Long Case (Obstetrics)	Gynaecology Case	Family Planning	Journal & log book	Practical Total
50	20	20	10	100

Subject: OBGY Practical (Prelim)								
ANC Case	Gynaecology Case	PNC / Post – Op Case	Family Planning Viva	Obstetrics Table Viva	Gynaec Table Viva	Spotting (2 x 10 spots)	Journal & log book	Practical Total
50	25	20	25	20	20	20	20	200

Subject: OBGY Practical (MUHS Final)							
ANC Case	Gynaecology Case (Diagnosis and discussion)	PNC / Post – Op Case (Diagnosis and discussion)	Family Planning Viva	Obstetrics Table Viva	Gynaec Table Viva	Spotting (4 x 10 spots)	Practical Total
50 *	25	20	25	20	20	40	200

* 10 marks each for history, examination, AETCOM, investigation & treatment.

Assessment in CBME is ONGOING PRCESS,

No Preparatory leave is permitted.

1. There shall be 6 internal assessment examinations in OBGY.

2. The suggested pattern of question paper for internal assessment, except prelim examination is attached at the end. Pattern of the prelims examinations should be similar to the University examinations.

3. Internal assessment marks for theory and practical will be converted to out of 50 (theory) +50 (practical). Internal assessment marks, after conversion, should be submitted to university within the stipulated time as per directives from the University. **Conversion Formula for calculation of marks in internal assessment examinations.**

	Theory	**Practical**
Phase II	**100**	**100**
Phase III/I	**100**	**100**
Phase III/II	**300**	**300**
Total	**500**	**500**
Conversion out of	**50**	**50**
Conversion formula	**Total marks in 6 IA theory examinations /10**	**Total marks in 6 IA Practical examinations /10**
Eligibility criteria after conversion	**20**	**20**
	Combined theory + Practical = 50	

4. While preparing Final Marks of Internal Assessment, the rounding-off marks shall done as illustrated in following table.

Total Internal Assessment Marks	Final rounded marks
33.01 to 33.49	33
33.50 to 33.99	34

5. Students must secure at least 50% marks of the total marks (combined in theory and practical / clinical; not less than 40 % marks in theory and practical separately) assigned for internal assessment in order to be eligible for appearing at the final University examination of that subject.
6. Internal assessment marks will not to be added to marks of the University examinations and will be shown separately in mark list.

7. **Remedial measures**

A. Remedial measures for non-eligible students

i) At the end of each internal assessment examination, students securing less than 50% marks shall be identified. Such students should be counseled at the earliest and periodically.
ii) Extra classes for such students may be arranged. If majority of the students found to be weak in a particular area then extra classes must be scheduled for all such students. Even after these measures, if a student is failed to secure 50% marks combined in theory and practical (40% separately in theory and practical) after prelim examination, the student shall not be eligible for final examination.
iii) Non eligible candidates are offered to reappear for repeat internal assessment examination/s, which must be conducted 2 months before next University examination. The pattern for this repeat internal assessment examination shall be similar to the final University examination. Only the marks in this examination shall be considered for deciding the eligibility criteria. Following conversion formula shall be used for converting the marks.

	Theory	**Practical**
Remedial examination (as per final examination pattern)	**200**	**200**
Conversion out of	**50**	**50**
Conversion formula	**Marks in remedial theory examinations /4**	**Marks in remedial Practical examinations /4**
Eligibility criteria after conversion	**20**	**20**
	Combined theory + Practical = 50	

B. <u>Remedial measures for absent students:</u>

i. If any of the students is absent for any of the 6 IA examinations due to any reasons, following measures shall be taken.
ii. The student is asked to apply to the academic committee of the college for reexamination, through HOD, to ascertain the genuineness of the reason for absentee.
iii. If permitted by academic committee, an additional examination for such students is to be conducted after prelims examination. Marks for such additional examination shall be equal to the missed examination.
iv. Even if a student has missed more than one IA examination, he/she can appear for only one additional IA examination. In such scenario, eligibility should be determined by marks obtained in internal assessment examinations for which the candidate has appeared, without changing the denominator.

Format for Internal Assessment
Theory Examination
IA – 1, IA – 2, IA – 3 & IA - 4

Question No.	Type of Question	No. of Questions (no. To be solved)	Max. Marks
1.	MCQ	10	10 (1 marks each)
2.	SAQ	6 (Any 5 out of 6)	25 (5 marks for each question x 5 questions)
3.	LAQ	1 (Compulsory)	15
		Total	50

Format for Internal Assessment
Theory Examination IA - 5

Question No.	Section	Type of Question	No. of Questions	Max. Marks
1.	A	MCQ	20	20 (1 marks each)
2.	B	LAQ	4 (Any 3 out of 4)	45 (15 marks for each question x 3 LAQ)
3.	C	SAQ	7 (Any 6 out of 7)	30 (5 marks for each question x 6 SAQ)
4.	C	SAQ	1 question from AETCOM	5
			Total	100

Format for MUHS Final Theory Examination
Paper I & II

Question No.	Section	Type of Question	No. of Questions	Max. Marks
1.	A	MCQ	20	20 (1 marks each)
2.	B	LAQ	4 (Any 3 out of 4)	45 (15 marks for each question x 3 LAQ)
3.	C	SAQ	7 (Any 6 out of 7)	30 (5 marks for each question x 6 SAQ)
4.	C	SAQ	1 question from AETCOM	5
			Total	100

Maharashtra University of Health Sciences, Nashik

OBSTETRICS AND GYNECOLOGY

Journal

Name of the College

_____

_____

Admission Year : _____

CERTIFICATE

This is to certify that,

Mr/Ms._____

Roll No. _____ has satisfactorily attended/completed all assignments mentioned in this journal as per the guidelines prescribed by Medical Council of India, for MBBS Competency Based Curriculum in the subject of Obstetrics and Gynaecology.

Date: ___/___/_____

Place: _____

Teacher -in-Charge **Professor and Head**

Instructions

The journal is a record of the cases seen by the designated student during her/his clinical postings in OBGY and during the labour room posting.

The student is expected to write down the details of:

1. Two normal low risk pregnant patients.
2. Five patients whose normal vaginal delivery the student has witnessed/assisted/conducted.
3. Two instrumental deliveries.
4. Three caeserean sections.
5. Pregnancies with complications.(12 Cases)
6. Three postnatal cases.
7. Eight gynaecology cases
8. Four family planning cases

Index

S. no	Topic	Page number	
	Normal pregnancy cases		
	Index of Antenatal Cases		
	Antenatal case record		
	Index of Labour cases		
	Labour case record		
	Index of postnatal cases		
	Postnatal case record		
	Index of Gynaecology cases		
	Gynaecology case record		
	Index of Family planning cases		
	Family planning case record		

Record of Attendance

Phase	Duration of posting	Posting from date	Posting to date	Attended days/out of days	Signature of Unit In charge
Phase II	4 weeks				
Phase III part 1	4 weeks				
Phase III part 2	12 weeks				

Teacher -in-Charge **Professor and Head**

Department of Obstetrics and Gynaecology

Antenatal Cases
(Seen and recorded)

Serial number	Case	Page number
1.	Anemia in pregnancy	
2.	Preeclampsia	
3.	Eclampsia	
4.	IUGR	
5.	Multifetal gestation	
6.	Breech	
7.	Previous caesarean	
8.	Preterm	
9.	Placenta praevia	
10.	Abruptio placentae	
11.	Heart disease in pregnancy	
12.	Diabetes in pregnancy	

Antenatal case-1(2+12 similar repetitions)

Name: Age:

Address: Occupation:

Socioeconomic status: Religion: Caste:

Education:

Booked/ registered (number of antenatal visits in pregnancy):

H/O Amenorrhoea

Chief complaints:

History of present pregnancy:

Menstrual history:

PMC:

LMP: EDD:

Obstetric history:

Past medical history:

Family history:

Diet history:

Personal history:

General examination:

Built: Height:

Weight: Nourishment:

General condition:

Temperature:

Pulse: Respiration:

BP:

Pallor:

Icterus, cyanosis, glossitis, angular stomatitis, JVP, Lymphadenopathy, clubbing,goitre

Breasts:

Systemic examination:

CVS

RS

CNS

Obstetric examination:

Inspection:

Palpation: Fundal height.....weeks

Symphysiofundal height:.....cms.Abdominal girth:.....cms

Leopold's 1st manoeuvre

Leopold's 2nd manoeuvre

Leopold's 3rd manoeuvre

Leopold's 4th manoeuvre

Auscultation

Provisional Diagnosis:

Investigations:

Routine:ANC Profile

Blood group, Rh Typing		Hb Platlet	
Blood sugar		HIV	
HBs antigen		VDRL	
Sickling/ Hb electrophoresis		Serum TSH	
Urine albumin Urine sugar		Urine culture senstivity	

USG:

Special investigations:

Final diagnosis:

Management:

Signature of teacher Date:

Labour Cases
(Attended and recorded)

Serial number	Case	Page numbers
1.	Normal Delivery: 5 cases	
2.	Instrumental delivery; 2 cases	
3.	Caesarean section: 3 cases	

Labour and delivery case-1(10 similar pages)

Name: Age:

Address: Occupation:

Socioeconomic status: Religion: Caste:

Education:

Booked/ registered (number of antenatal visits in pregnancy):

H/O Amenorrhoea:

Chief complaints:

History of present pregnancy:

Menstrual history:

PMC:

LMP: EDD:

Obstetric history :

Past medical history:

Family history:

Diet history:

Personal history:

General examination:

Built: Height:

Weight: Nourishment:

General condition:

Temperature:

Pulse: Respiration:

BP:

Pallor,icterus, cyanosis, glossitis, angular stomatitis, thyroid, JVP, Lymphadenopathy, clubbing

Breasts:

Systemic examination:

CVS

RS

CNS

Obstetric examination:

Inspection:

Palpation:

Fundal height Symphysio fundal height

Abdominal girth

Leopold's 1st manoeuvre

Leopold's 2nd manoeuvre

Leopold's 3rd manoeuvre

Leopold's 4th manoeuvre

Auscultation

Provisional Diagnosis:

Investigations:

Routine:

Blood group, Rh Typing		Hb Platelets	
PGBS		HIV	
HBs antigen		VDRL	
Sickling/ Hb electrophoresis		Serum TSH	
Urine albumin Urine sugar		Urine culture senstivity	

USG:

Final diagnosis:Labour :Induced/Spontaneous/Active management

Delivery details: Normal/Low Forceps/Ventouse

Presentation:Vertex/Face/Breech

Episiotomy:Yes/No

AMTSL;Yes/No: Details if yes:

Placental delivery: controlled cord traction/Manual removal of placenta

Delivery/Operations Notes:

Indication for Intervention in case of Instrumental delivery or Caeserean section:

Name of Obstetrician:

Assistant:

Anaesthesia

Anaesthesiologist:

PPH:Yes/No

Placental weight: Placental abnormality:

Cord length

Baby notes:

Date of birth

Sex of baby : Birth weight : Full term/ Preterm/Postterm

Apgar score:1 min 5 min

Congenital malformation

Postnatal period follow up including breast feeding:

Condition at the time of discharge:

Involution of uterus

Perineum

Lochia:

Treatment received:

Mother Baby

Treatment advised at discharge:

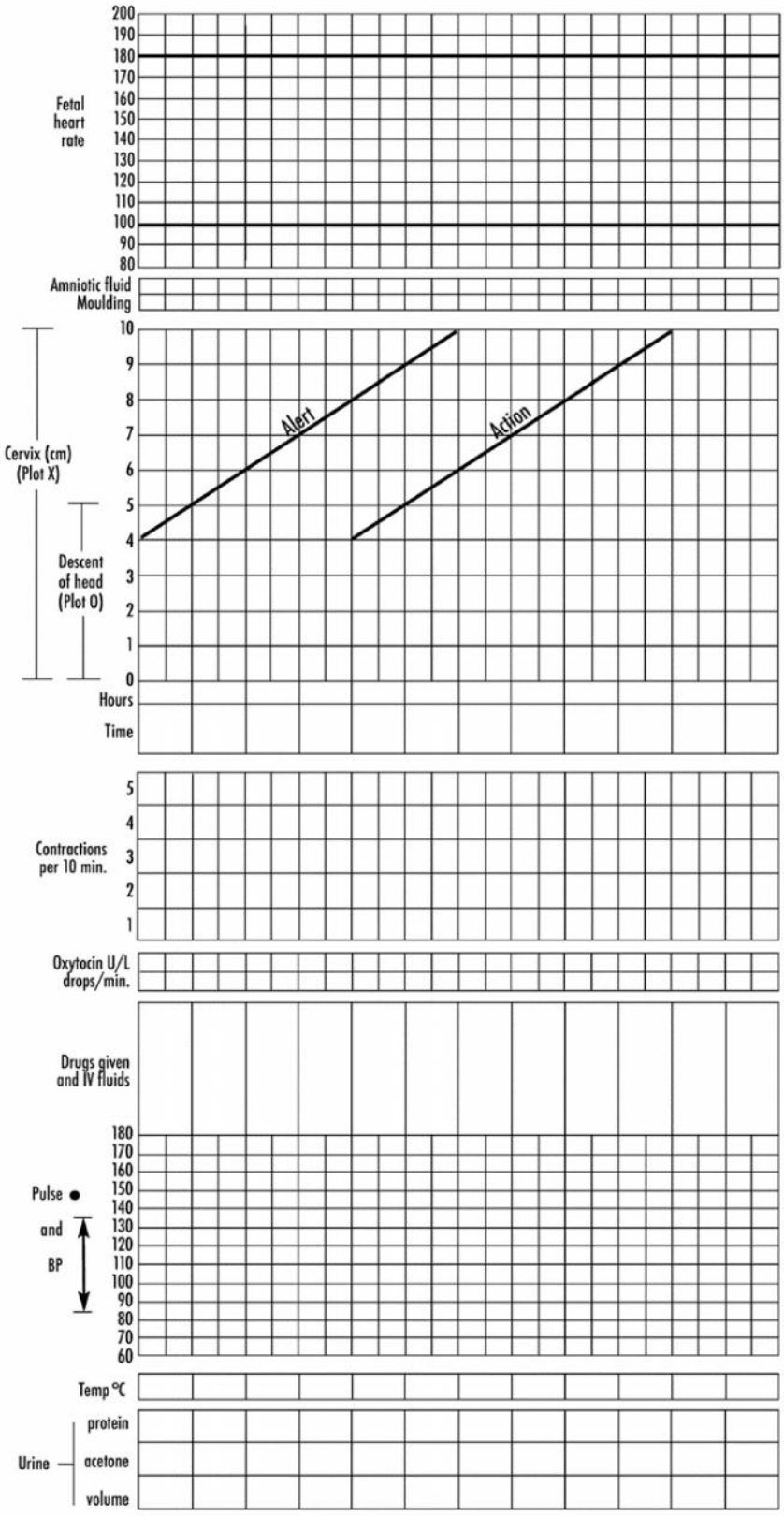
Contraception advised

Signature of teacher:

Date:

Name | Gravida | Para | Hospital number

Date of admission | Time of admission | Ruptured membranes | hours



Postnatal Cases

(Seen and recorded)

Serial number	Case	Page number
1.	Post vaginal delivery 1 case	
2.	Post caesarean section 1 case	
3.	Abnormal puerperium 1 case	

Postnatal case-1(3 similar repetitions)

Name: Age:

Address: Occupation:

Socioeconomic status: Religion: Caste:

Education:

Booked/ registered (number of antenatal visits in pregnancy):

Date and time of delivery:

Gestational age at delivery:

Intranatal history:

Relevant complaints at time of admission:

Examination findings at time of admission:

Duration of labour:

PPH:Yes/No

Any abnormal findings:

Type of delivery:

If caesarean or instrumental delivery: Indication

Condition of baby at birth:

Time of birth, sex of baby, birth weight:

Baby with mother /in NICU:

Postnatal history:

Lochia:

Pain:

Bowel/bladder:

Breast feeding or any problem:

Antenatal history:

Obstetric history :

Past medical history:

Family history:

Diet history:

Personal history:

General examination:

Built: Height:

Weight: Nourishment:

General condition:

Temperature:

Pulse: Respiration:

BP:

Pallor,icterus, cyanosis, glossitis, angular stomatitis, JVP, Lymphadenopathy, clubbing,goitre

Breasts:

Systemic examination:

CVS

RS

CNS

Abdominal examination:

Inspection:

Palpation:

Fundal height:

Involution of uterus:

Bowel sounds in case of caeser:

Abdominal wound/Perineum:

Bleeding PV/Lochia:

Urine Output:

Provisional Diagnosis:

Investigations:

Routine:

Blood group, Rh Typing		Hb	
BS		HIV	
HBs antigen		VDRL	
Sickling/ Hb electrophoresis		Serum TSH	
Urine albumin		Urine culture sensitivity	

Special investigations:

Treatment advised/given to

Mother :

Baby:

Treatment advised at discharge:

Contraception advised:

Signature of teacher:

Date:

Gynaecology Cases
(Seen and recorded)

Serial number	Case	Page number
1.	Vaginitis	
2.	Fibroid uterus	
3.	Genital prolapse	
4.	Infertility	
5.	Adenexal mass/Ovarian mass	
6.	Abnormal uterine bleeding(O)	
7.	Post menopausal bleeding	
8.	Cancer cervix	

Gynaecology case-1(8 similar repetitions)

Name: Age:

Address: Occupation:

Socioeconomic status: Religion: Caste:

Education:

Chief complaints:

History of present illness:

Menstrual history:

Obstetric history:

Past medical history:

Family history:

Diet history:

Personal history:

General examination:

Built: Height:

Weight: Nourishment:

General condition:

Temperature:

Pulse: Respiration:

BP:

Pallor,icterus, cyanosis, glossitis, angular stomatitis, goitre, JVP, Lymphadenopathy, clubbing

Breasts:

Systemic examination:

CVS

RS

CNS

Per Abdomen examination:

Per Speculum findings:

Per vaginum findings:

Provisional Diagnosis:

Investigations as indicated

Blood group, Rh Typing		CBC Hb TLC DLC Platelet	
BS- F, PP		LFT	
KFT		Serum TSH	
Sickling/ Hb electrophoresis		ECG	
Urine albumin		Urine culture senstivity	
ECG			
Pap smear			
USG			
Colposcopy			
Cervical biopsy			
Endometrial,endocervical			

biopsy	
CT/MRI	

Any other investigations:

Final diagnosis:

Operation notes:

Treatment received

Postoperative period

Histopathology:

Condition on discharge:

Treatment advised:

Signature of teacher: Date

Family planning Cases

(Seen and recorded)

Serial number	Case	Page number
1.	Tubectomy-Minilap or laparoscopic	
2.	MTP first trimester (suction and evacuation)	
3.	MTP second trimester	
4.	CuT insertion	

Family planning case-1(4 similar repetitions)

Name: Age:

Address: Occupation:

Socioeconomic status: Religion: Caste:

Education:

Menstrual history:

Obstetric history :

Previous Contraceptive history:

Past medical history:

Family history:

Personal history:

General examination:

Systemic examination:

Per Abdomen examination:

Per Speculum findings:

Per vaginum findings:

Investigations as indicated

Blood group, Rh Typing		Hb	
BS- F, PP		Urine albumin	
USG			

Any other investigations:

Operation notes:

Treatment received

Postoperative period

Condition on discharge:

Advice on discharge;

Signature of teacher:

Date:

Maharashtra University of Health Sciences Nashik

OBSTETRICS AND GYNECOLOGY

LOGBOOK - MBBS

AS PER COMPETENCY BASED CURRICULUM

Name of the College

Admission Year : _____

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BIODATA OF THE CANDIDATE

PHOTO

Name of the student:

Name of the course: MBBS

Date of birth:

Father's / Guardian's name:

Mother's name:

Blood group:

Permanent Address: Temporary Address:

…… ……

…… …… .

Student's contact no:

Father's/ Guardian's contact no:

Student's Email id:

Father's/ Guardian' s Email id:

Candidates Signature: …….. Date: .....

LOG BOOK CERTIFICATE

This is to certify that,

Mr/Ms._____ _____

Roll No. _____ has satisfactorily attended/completed all assignments mentioned in this logbook as per the guidelines prescribed by Medical Council of India, for MBBS Competency Based Curriculum in the subject of Obstetrics and Gynecology.

Date: ___/___/_____

Place: _____

Teacher -in-Charge

Professor and Head

Department of Obstetrics and Gynecology

Instructions

The undergraduate medical education program is designed with a goal to create an “Indian Medical Graduate” (IMG) p ossessing requisite knowledge, skills, attitudes, values and responsiveness, so that she or he may function appropriately and effectively as a physician of first contact of the community while being globally relevant.

This Logbook gives an opportunity to achieve goals pertaining to skill learning in Obstetrics and Gynecology, so that IMG becomes capable to provide respectful maternity and Gynecology care to the society.

1) Logbook is a record of the academic / co-curricular activities of the designated student, who would be responsible for maintaining his/her logbook.

2) The student is responsible for getting the entries in the logbook verified by the Faculty in charge regularly. Certifications for competencies to be taken on same day.

3)Refer to university course content for skill to ensure which competencies to be covered in which phase

4) Entries in the logbook will reflect the activities undertaken in the department & have to be scrutinized by the, teacher in c harge of session, Head of the concerned unit and department.

5) The logbook is a record of various activities by the student like:

- Overall participation & performance

- Attendance

- Participation in sessions

- Record of completion of pre-determined activities.

- Acquisition of selected competencies

6) The logbook is the record of work done by the candidate in that department / specialty and should be verified by the college before submitting the application of the students for the University examination.

Record of Attendance

Phase	Duration of posting	Posting from date	Posting to date	Attended days/out of days	Signature of Unit In charge
Phase II	4 weeks				
Phase III	4 weeks				
Phase IV	12 weeks				

.....

Signature of Head of theDepartment

Records of Internal Assessments

-	Exam No.	Date	Theory	Date	Practical including Viva	Signature of teacher
1	Phase II-1st exam		/50		/50	
2	Phase II-2nd exam		/50		/50	
3	Phase III-1st exam		/50		/50	
4	Phase III-2nd exam		/50		/50	
5	Phase IV-1st exam		/100		/100	
6	Prelims		/200		/200	
	Remedial if any					
	Total		/500		/500	
	Conversion= Total/5		/100		/100	

.....

Signature of Head of theDepartment

CLINICAL SKILLS : LIST OF COMPETENCIES

Clinical skills can be assessed by case presentation, case-based discussion, objective structured clinical assessment the checklist, MiniCex, as per the institutional preference.

Competency # addressed	Name of Activity
OG5.1	Describe, discuss and identify pre-existing medical disorders and discuss their management; discuss evidence-based intrapartum care
OG5.2	Determine maternal high risk factors and verify immunization status
OG6.1	Describe, discuss and demonstrate the clinical features of pregnancy, derive and discuss its differential diagnosis, elaborate the principles underlying and interpret pregnancy tests.
OG8.2	Elicit, document and present history in a OBGY patient including obstetric and menstrual history, last menstrual period, comorbid conditions and past medical history
OG8.3	Describe, demonstrate, document and perform a general,systemic and abdominal examination includingobstetrical examinations and clinical monitoring of maternal and fetal well-being.
OG8.4	Describe and demonstrate clinical monitoring of maternal and fetal well-being

OG8.5	Describe and demonstrate pelvic assessment in a model
OG35.1	Obtain a logical sequence of history, and perform a humane and thorough clinical examination, excluding internal examinations (perrectal and per-vaginal)
OG35.2	Arrive at a logical provisional diagnosis after examination.
OG35.3	Recognize situations, which call for urgent or early treatment at secondary and tertiary centres and make a prompt referral of such patients after giving first aid or emergency treatment.
OG35.5	Determine gestational age, EDD and obstetric formula
OG36.1	Plan and institute a line of treatment, which is need based, cost effective and appropriate for common conditions taking into consideration (a) Patient (b) Disease (c) Socio-economic status (d) Institution/ Governmental guidelines.
OG36.2	Organise antenatal, postnatal, well-baby and family welfare clinics
OG38.4	Assess the need for and issue proper medical certificates to patients for various purposes

PSYCHOMOTOR / PERFORMANCE SKILLS:

Skills can be assessed by objective structured clinical assessment with checklist, Global Rating Scale, Simulated patients as per the institutional preference.

Colleges are instructed prepare modules for skill training as per NMC guidelines.

Module 5 Skill Training.

I – independent certification

D - demonstration

LIST OF COMPETENCIES

Competency # addressed	Name of Activity
OG9.2	Describe the steps and observe/ assist in the performance of an MTP evacuation

OG13.3	Observe/ assist in the performance of an artificial rupture of membranes
OG13.4	Demonstrate the stages of normal labor in a simulated environment / mannequin
OG13.5	Observe and assist the conduct of a normal vaginal delivery
OG15.2	Observe and assist in the performance of an episiotomy and demonstrate the correct suturing technique of an episiotomy in a simulated environment. Observe/Assist in operative obstetrics cases – including - CS, Forceps, vacuum extraction, and breech delivery
OG18.2	Demonstrate the steps of neonatal resuscitation in a simulated environment
OG19.3	Observe/ assist in the performance of tubal ligation
OG19.4	Enumerate the indications for, describe the steps in and insert and remove an intrauterine device in a simulated environment
OG33.3	Describe and demonstrate the screening for cervical cancer in a simulated environment
OG34.4	Operative Gynaecology : Understand and describe the technique and complications: Dilatation & Curettage (D&C); EA-ECC, cervical biopsy; abdominal hysterectomy; myomectomy; surgery for ovarian tumours; staging laparotomy; vaginal hysterectomy including pelvic floor repair; Fothergill's operation, Laparoscopy; hysteroscopy; management of postoperative complications
OG35.7	Obtain informed consent for any examination / procedure
OG35.8	Write a complete case record with all necessary details

OG35.9	Write a proper discharge summary with all relevant information
OG35.10.	Write a proper referral note to secondary or tertiary centres or to other physicians with all necessary details
OG35.11	Demonstrate the correct use of appropriate universal precautions for self-protection against HIV and hepatitis
OG35.12	Obtain a PAP smear in a stimulated environment
OG35.13	Demonstrate the correct technique to perform artificial rupture of membranes in a simulated / supervised environment
OG35.14	Demonstrate the correct technique to perform and suture episiotomies in a simulated/ supervised environment
OG35.15	Demonstrate the correct technique to insert and remove an IUD in a simulated/ supervised environment
OG35.16	Diagnose and provide emergency management of antepartum and postpartum hemorrhage in a simulated / guided environment
OG35.17	Demonstrate the correct technique of urinary catheterisation in a simulated/ supervised environment
OG36.3	Demonstrate the correct technique of punch biopsy of uterus in a simulated/ supervised environment
OG37.1	Observe and assist in the performance of a Caesarean section
OG37.2	Observe and assist in the performance of Laparotomy
OG37.3	Observe and assist in the performance of Hysterectomy – abdominal/vaginal

OG37.4	Observe and assist in the performance of Dilatation & Curettage (D&C)
OG37.5	Observe and assist in the performance of Endometrial aspiration - endocervical curettage (EA-ECC)
OG37.6	Observe and assist in the performance of outlet forceps application of vacuum and breech delivery
OG37.7	Observe and assist in the performance of MTP in the first trimester and evacuation in incomplete abortion
OG38.1	Laparoscopy :observe
OG38.2	Hysteroscopy ;observe
OG38.3	Lap sterilization: observe

AETCOM SKILLS

Counselling for Investigation, Treatment, Prognosis, Blood donation, Organ Donation, Breaking Bad news. All types of consent. Medicolegal aspects and Ethics, Empathy and professionalism as per the Phase of the MBBS. Include cases of Allied branches also.

Competency to be assessed during Clinical postings and /or small group discussions.

LIST OF COMPETENCIES

Competency addressed	Name of Activity
OG8.6	Assess and counsel a patient in a simulated environment regarding appropriate nutrition in pregnancy
OG13.4	Counsel on methods of safe abortion.
OG17.2	Counsel in a simulated environment, care of the breast, importance and the technique of breast feeding
OG19.2	Counsel in a simulated environment, contraception and puerperal sterilisation

OG20.2	In a simulated environment administer informed consent to a person wishing to undergo Medical Termination of Pregnancy
OG35.4	Demonstrate interpersonal and communication skills befitting a physician in order to discuss illness and its outcome with patient and family
OG35.6	Demonstrate ethical behavior in all aspects of medical practice.
OG35.11	HIV and hepatitis- counselling patients

Log book record of clinical skills

Sr. no.	Phase	Competency # addressed	Name of Activity	Site Ward, skill lab, opd , casualty ,	Date completed	Attempt at activity First (F) Repeat (R) Remedial (Re)	Rating Below (B)expectations Meets (M)expectations Exceeds (E) expectations OR Numerical Score	Decision of faculty Completed (C) Repeat (R) Remedial (Re)	Initial of faculty	Feedback received Initial of Learner	Method of assessment and Score
1.		OG5.1									
2.		OG5.2									
3.		OG6.1									
4.		OG8.2									
5.		OG8.3									
6.		OG8.4									
7.		OG8.5									
8.		OG35.1									
9.		OG35.2									
10.		OG35.3									
11.		OG35.5									
12.		OG36.1									

13.		OG36.2									
14.		OG38.4									

Psychomotor skills

Sr. no.	Phase	Competency # addressed	Name of Activity	Site Ward, skill lab, opd , casualty ,	Date completed	Attempt at activity First (F) Repeat (R) Remedial (Re)	Rating Below (B)expectations Meets (M)expectations Exceeds (E) expectations OR Numerical Score	Decision of faculty Completed (C) Repeat (R) Remedial (Re)	Initial of faculty	Feedback received Initial of Learner	Method of assessment and Score
1.		OG9.2									
2.		OG13.3									
3.		OG13.4									
4.		OG13.5									
5.		OG15.2									
6.		OG18.2									
7.		OG19.3									
8.		OG19.4									
9.		OG33.3									

10.		OG34.4									
11.		OG35.7									
12.		OG35.8									
13.		OG35.9									
14.		OG35.10.									
15.		OG35.11									
16.		OG35.12									
17.		OG35.13									
18.		OG35.14									
19.		OG35.15									
20.		OG35.16									
21.		OG35.17									
22.		OG36.3									
23.		OG37.1									
24.		OG37.2									
25.		OG37.3									
26.		OG37.4									
27.		OG37.5									
28.		OG37.6									
29.		OG37.7									

30.		OG38.1									
31.		OG38.2									
32.		OG38.3									

AetCom skills

Sr. no.	Phase	Competency # addressed	Name of Activity	Site Ward, skill lab, opd , casualty ,	Date completed	Attempt at activity First (F) Repeat (R) Remedial (Re)	Rating Below (B)expectations Meets (M)expectations Exceeds (E) expectations OR Numerical Score	Decision of faculty Completed (C) Repeat (R) Remedial (Re)	Initial of faculty	Feedback received Initial of Learner	Method of assessment and Score
1.		OG8.6									
2.		OG13.4									
3.		OG17.2									
4.		OG19.2									
5.		OG20.2									
6.		OG35.4									

7.		OG35.6									
8.		OG35.11									

REFLECTION ON AETCOM MODULE For PHASE IV

Module 4.2- Case studies in medico-legal and ethical situations

Competency addressed	Level
Identify and discuss medico-legal, socio-economic and ethical issues as it pertains to abortion/ Medical Termination of pregnancy and reproductive rights	KH

Reflection (minimum 200 words) -1 Date:

Signature of Teacher-in-charge

REFLECTION ON AETCOM MODULE

Module 4.9- Medical Negligence

Competency addressed	Level
1. Identify, discuss and defend medico-legal, socio-cultural, professional and ethical issues pertaining to medical negligence	KH
2. Identify, discuss and defend medico-legal, socio-cultural, professional and ethical issues pertaining to malpractice	KH

Reflection (minimum 200 words)-2
Date:

Signature of Teacher-in-charge

PAP smear obtaining and filling form for same.
(2 cases so 2 similar repetitions)

Signature of teacher:

Date:

Discharge summary(as per institutional format)

1. Vaginal delivery

Signature of teacher:Date:

Discharge summary

2. Caesarean section

Signature of teacher: Date:

Discharge summary

3. Hysterectomy abdominal

Signature of teacher: Date:

Discharge summary

4. Hysterectomy vaginal

Signature of teacher: Date:

Discharge summary

5. MTP

Signature of teacher:

Date:

Discharge summary

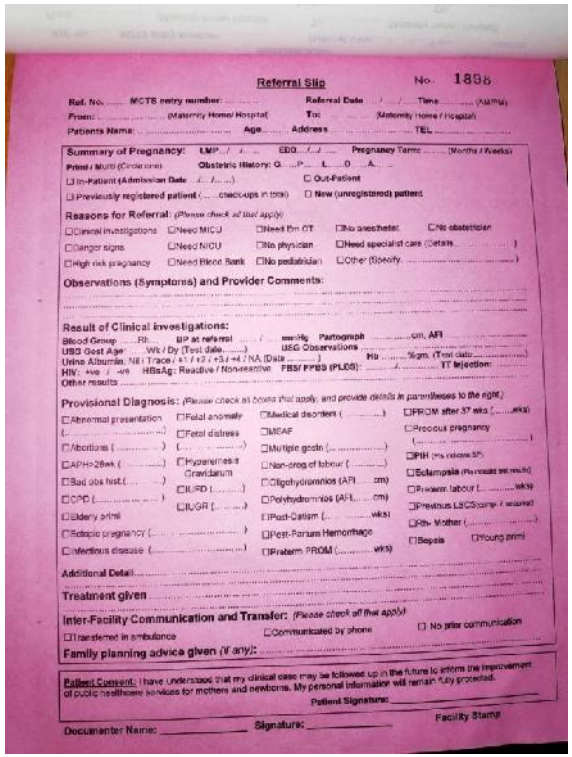
6. Tubal ligation

Signature of teacher:

Date

Referral note for a higher centre for obstetric patient

(this format to be typed in journal)



Referral Slip No. 1888

Ref. No. ..... MCTS entry number: ..... Referral Date ..../..../..... Time ..... (AM/PM)

From: ..... (Maternity Home/ Hospital) To: ..... (Maternity Home / Hospital)

Patients Name: ..... Age..... Address ..... TEL .....

Summary of Pregnancy: LMP.../.../..... EDD.../.../..... Pregnancy Terms ..... (Months / Weeks)

Primi / Multi (Circle one) Obstetric History: G.....P.....L.....O.....A.....

☐ In-Patient (Admission Date .../.../.....) ☐ Out-Patient

☐ Previously registered patient (.....check-ups in total) ☐ New (unregistered) patient

Reasons for Referral: *(Please check all that apply)*

☐Clinical investigations ☐Need MICU ☐Need for OT ☐No anesthetist ☐No obstetrician

☐Danger signs ☐Need NICU ☐No physician ☐Need specialist care (Details .....)

☐High risk pregnancy ☐Need Blood Bank ☐No pediatrician ☐Other (Specify .....)

Observations (Symptoms) and Provider Comments:

.....

.....

Result of Clinical Investigations:

Blood Group .....Rh..... BP at referral ...../..... mm Hg Partograph .....cm, AFI .....

USG Gest Age: ..... Wk / Dy (Test date.....) USG Observations .....

Urine Albumin: Nil / Trace / +1 / +2 / +3 / +4 / NA (Date .....) Hb .....%gm. (Test date.....)

HIV: +ve / -ve HBsAg: Reactive / Non-reactive FBS/ PPBS (PLDS): ...../..... TT Injection: .....

Other results .....

Provisional Diagnosis: *(Please check all boxes that apply, and provide details in parentheses to the right.)*

☐Abnormal presentation (.....) ☐Fetal anomaly ☐Fetal distress ☐Medical disorders (.....) ☐PROM after 37 wks (.....wks)

☐Abortions (.....) (.....) ☐MSAF ☐Precous pregnancy (.....)

☐APH>28wk (.....) ☐Hyperemesis Gravidarum ☐Multiple gests (.....) ☐PIH (Hb <above 5*)

☐Bad obs hist (.....) ☐IUFD (.....) ☐Non-progs of labour (.....) ☐Eclampsia (Pre-eclamptic results)

☐CPD (.....) ☐IUGR (.....) ☐Oligohydramnios (AFI.....cm) ☐Preterm labour (.....wks)

☐Elderly primi ☐Polyhydramnios (AFI.....cm) ☐Previous LSCS (one / several)

☐Ectopic pregnancy (.....) ☐Post-Datism (.....wks) ☐Rh- Mother (.....)

☐Infectious disease (.....) ☐Post-Partum Hemorrhage ☐Sepsis ☐Young primi

☐Preterm PROM (.....wks)

Additional Detail: .....

.....

Treatment given .....

.....

Inter-Facility Communication and Transfer: *(Please check all that apply)*

☐Transferred in ambulance ☐Communicated by phone ☐ No prior communication

Family planning advice given (if any): .....

Patient Consent: I have understood that my clinical case may be followed up in the future to inform the improvement of public healthcare services for mothers and newborns. My personal information will remain fully protected.

Patient Signature: _____

Documenter Name: _____ Signature: _____ Facility Stamp

Signature of teacher:

Date:

Medical certificate(for obstetric or gynaecological condition)

Signature of teacher:

Date:

Self-Directed Learning, Seminars, Tutorials, Projects, Quizzes, extracurricular activities

Sr. No.	Self- directed learning (Seminars, Tutorials, Projects, Quizzes, Extracurricular activities)	Date	Phase	Signature of Teacher

Reflection (minimum200words) – 1 **Date :**

TOPIC:

Reflection (minimum 200 words) – 2
Date :

TOPIC:

ANNEXURE 1:

RECORDING FORM FOR MINI – CEX

EVALUATOR : DATE :

STUDENT :

YEAR :

PATIENT DIAGNOSIS :

SETTINGS :

AMBULATORY	NEW	COMPLEXITY : LOW
IN PATIENT	FOLLOW UP	MODERATE
ED		HIGH
OTHER :		

PATIENT AGE PATIENT SEX

FOCUS : DATA GATHERING / DIAGNOSIS / THERAPY / COUNSELLING

1. **MEDICAL INTERVIEWING SKILLS** (OBSERVED / NOT OBSERVED)

1 2 3 / 4 5 6 / 7 8 9

2. **PHYSICAL INTERVIEWING SKILLS** (OBSERVED / NOT OBSERVED)

1 2 3 / 4 5 6 / 7 8 9

3. **HUMANISTIC QUALITIES** / PROFFESIONALISM (OBSERVED / NOT OBSERVED)

1 2 3 / 4 5 6 / 7 8 9

4. **CLINICAL JUDGEMENT** (OBSERVED / NOT OBSERVED)

1 2 3 / 4 5 6 / 7 8 9

5. **COUNSELLING SKILLS** (OBSERVED / NOT OBSERVED)

1 2 3 / 4 5 6 / 7 8 9

6. **ORGANIZATION / EFFICIENCY** (OBSERVED / NOT OBSERVED)

1 2 3 / 4 5 6 / 7 8 9

7. **OVERALL CLINICAL COMPETENCE** (OBSERVED / NOT OBSERVED)

1 2 3 / 4 5 6 / 7 8 9

MINI CEX TIME : OBSERVING : _____ MINS

PROVIDING FEEDBACK _____ MINS

UNSATISFACTORY 1,2,3

SATISFACTORY 4, 5, 6

SUPERIOR 7, 8, 9

EVALUATOR SATISFACTION WITH MINI CEX

LOW 1 2 3 4 4 5 6 7 8 9 HIGH

RESIDENT SATISFACTION WITH MINI CEX

LOW 1 2 3 4 4 5 6 7 8 9 HIGH

COMMENTS :

STUDENT SIGNATURE EVALUATOR SIGNATURE

ANNEXURE 2:

AetCom skills can be assessed by use of Kalamazoo consensus.

Criteria
Builds relationship
Opens the discussion
Gathers information
Understands the patient's perspective
Shares information
Manages flow
Overall rating
Signature of teacher

Communication skills rating scale adapted from Kalamazoo consensus statement.

Rating 3 - Poor, 4 -6 Satisfactory, 6 -10 Superior

MUHS Ophthalmology CBME U.G Curriculum

(a) **Competencies**: The student must demonstrate :

1. Knowledge of common eye problems in the community
2. Recognize, diagnose and manage common eye problems and identify indications for referral,
3. Ability to recognize visual impairment and blindness in the community and implement National programmes as applicable in the primary care setting.

(b) **Integration:** The teaching should be aligned and integrated horizontally and vertically in order to allow the student to understand the structural basis of ophthalmologic problems, their management and correlation with function, rehabilitation and quality of life.

TEACHING METHODS & HOURS

	Large Group Teaching	Small group teaching/Practical /Tutorials	SDL	AETCOM	Total	Clinical/Field Posting
	-	-	-	-	-	-
3rd part I/II	30 hours	60 hours	10 hours	MODULE 3.2	100 hours	PHASE 2 PHASE 3
Total	30 hours	60 hours	10 hours		100 hours	8 weeks

CURRICULUM

UG CURRICULUM FOR LARGE GROUP TEACHING

Topic code	Topic	No. of hours (30)	Integration	Method of Teaching
	Visual Acuity Assessment			
OP1.1	Describe the physiology of vision	1 hr	physiology	LGT
OP1.2	Define, classify and describe the types and methods of correcting refractive errors	2 hrs		LGT
OP1.4	Enumerate the indications and describe the principles of refractive surgery	1 hr		LGT
	Lids and Adnexa, orbit			
OP2.1	Enumerate the causes, describe and discuss the etiology, clinical presentations and diagnostic features of common conditions of the lid and adnexa including	2 hr	Human anatomy	LGT

	Hordeolumexternum / internum, blepharitis, preseptal cellulitis , dacryocystitis , hemangioma, dermoid, ptosis , entropion, lid lag, lagophthalmos			
OP2.6	Enumerate the causes and describe the differentiating features and clinical features of proptosis	1 hr		LGT
	Conjunctiva			
OP3.3	Describe the aetiology , pathophysiology, ocular features, differential diagnosis, complications and management of various causes of conjunctivitis	2hr		LGT
	Corneas			
OP4.1 & OP4.2	Enumerate, describe and discuss the types and causes of corneal ulceration Enumerate and discuss the differential diagnosis of infective Keratitis	3 hr	Human anatomy	LGT
OP4.4	Enumerate the causes and discuss the management of dry eye	1hr		LGT
OP4.5	Enumerate the causes of corneal blindness	1 hr		LGT
OP4.6	Enumerate the indications and types of keratoplasty	1 hr		LGT
OP4.9	Describe and discuss the importance and protocols involved in eye donation and eye banking	1 hr		LGT
	Iris and Anterior Chamber			
OP6.1 OP6.2	Describe clinical signs of intraocular inflammation and enumerate the features that distinguish granulomatous from non granulomatous inflammation. Identify and distinguish acute iridocyclitis from chronic iridocyclitis	2 hrs		LGT
OP6.7	Enumerate and discuss the aetiology, the clinical distinguishing features of shallow and deep anterior chamber . Choose appropriate investigations for patients with above conditions of anterior chamber	4 hr	Human Anatomy	LGT
	Lens			

OP7.2	Describe and discuss the aetio-pathogenesis , stages of maturation and complications of cataract	1 hr	Pathology	LGT
OP7.4	Enumerate the types of cataract surgey and describe the steps intraoperative and postoperative complications of extracapsular cataract extraction surgery	1 hr		LGT
	Retina & Optic Nerve			
OP8.1	Discuss the aetiology , pathology , clinical features and management of vascular occlusion of the retina	1 hr	Human Anatomy , Pathology	LGT
OP8.3	Demonstrate the correct technique of a fundus examination and describe and distinguish the funduscopic features in normal condition and in conditions causing abnormal retinal exam	1 hr		LGT
OP8.5	Describe and discuss the correlative anatomy , aetiology , clinical manifestations, diagnostic tests , imaging and management of diseases of optic nerve and visual pathway	2 hr		LGT
	Miscellaneous			
OP9.2	Classify , enumerate the types, methods of diagnosis and indications for referral in a patient with heterotropia/ strabismus	1 hr		LGT
OP9.5	Describe the evaluation and enumerate the steps involved in the stabilization , initial management and indication for referral in a patient with ocular injury	1 hr		LGT

UG CURRICULUM FOR SMALL GROUP TEACHING

Topic code	Topic	No. of hours (60)	Integration	Method of Teaching
	Visual Acuity Assessment			
OP1.5	Define, enumerate the types and the mechanism by which strabismus leads to amblyopia	2 hr		SGT
	Lids and Adnexa, orbit			
OP2.4	Describe the aetiology , clinical presentation, Discuus the complication and management of orbital cellulitis	2 hr		SGT
OP2.5	Describe clinical features on ocular examination and management of a patient with cavernous sinus thrombosis	2 hr		SGT
OP2.6	Enumerate the causes and describe the differentiating features and clinical features and management of proptosis	3 hr		SGT
OP2.7	Classify the various types of orbital tumors . Differentiate the symtoms and signs of the presentations of various types of ocular tumors	4 hr		SGT
OP2.8	List the investigations helpful in diagnosis of orbital tumors. Enumerate the indications of appropriate referral	2 hr		SGT
	Conjunctiva			
OP3.4	Describe the etiology, pathophysiology , ocular features, differential diagnosis , complication and management of trachoma	2hr		SGT
OP3.5	Describe the etiology, pathophysiology , ocular features, differential diagnosis , complication and management of vernal catarrh	2 hr		SGT
OP3.6	Describe the etiology, pathophysiology , ocular features, differential diagnosis , complication and management of pterygium	2 hr		SGT

OP3.7	Describe the etiology, pathophysiology , ocular features, differential diagnosis , complication and management of symblepharon	1 hr		SGT
	Cornea			
OP4.3	Enumerate the causes of corneal edema	2 hr		SGT
OP4.7	Enumerate the indications and describe the methods of tarsorraphy	2 hr		SGT
	Sclera			
OP5.1	Define, enumerate and Describe the etiology, associated systemic conditions , ocular features, indications for referral , complication and management of episcleritis	2 hr		SGT
OP5.2	Define, enumerate and Describe the etiology, associated systemic conditions , ocular features, indications for referral , complication and management of scleritis	2 hr		SGT
	Iris and anterior chamber			
OP6.3	Enumerate systemic conditions that can present as iridocyclitis and describe their ocular manifestations	3 hr		SGT
OP6.4	Describe and distinguish hyphema and hypopyon	3 hr		SGT
OP6.5	Describe and discuss the angle of the anterior chamber and its clinical correlates	3 hr		SGT
OP6.8	Enumerate and choose the appropriate investigations for patients with conditions affecting the uvea	3 hr		SGT
OP6.9	Choose the correct local and systemic therapy for conditions of anterior chamber and enumerate their indications , adverse events and interactions	2 hr		SGT
	Lens			
OP7.1	Describe the surgical anatomy and the metabolism of lens	2 hr	Anatomy & biochemistry	SGT
	Retina and Optic Nerve			SGT

OP8.2	Enumerate the indications for laser therapy in the treatment of retinal disease (including retinal detachment, retinal degeneration , diabetic retinopathy and hypertensive retinopathy)	4 hr		SGT
OP8.8	Enumerate and discuss treatment modalities in management of diseases of retina	5hr		SGT
	Miscellaneous			
OP9.3	Describe the role of refractive error correction in a patient with headache and enumerate the indications of refrral	2 hr		SGT
OP9.4	Enumerate, describe and discuss the causes of avoidable blindness and the national programs for control of blindness (including vision 2020)	3 hr		SGT

UG CURRICULUM FOR CLINICAL DEMONSTRATION/BED SIDE TEACHING / DOAP:

Topic code	Topic	No. of hours (10)	Integration	Method of Teaching
	Visual Acuity Assessment			
OP1.3	Demonstrate the steps in performing the visual acuity assessment for distance vision, near vision, color vision , the pin hole test and the menace and blink reflexes	1 hr	physiology	DOAP
	Lids and Adnexa , Orbit			
OP2.2	Demonstrate the symptoms and clinical signs of conditions enumerated in OP2.1	1 hr	Human Anatomy	DOAP
OP2.3	Demonstrate under supervision clinical procedure performed in the lid including : bells phenomenon, assessment of entropion / ectropion, perform the	1 hr		DOAP

	regurgitation test of lacrimal sac, massage technique in congdacryocystitis and trichiatic cilia removd by epilation			
	Conjunctiva			
OP3.1	Elicit document and present an appropriate history in a patient presenting with a " red eye" including congestion , discharge , pain	1 hr		DOAP
OP3.2	Demonstrate document and present the correct method of examination of a red eye including vision assessment , corneal lustre, pupil abnormality, ciliary tenderness			
OP3.8	Demonstrate the correct technique of removal of foreign body from the eye in a simulated environment	1 hr		DOAP
OP3.9	Demonstrate the correct technique of instillation of eye drops in a simulated environment			
	Cornea			
OP4.8	Demonstrate the correct technique of removal of foreign body in cornea in a simulated environment			
OP4.10	Counsel patient and family about eye donation in a simulated environment	1 hr		DOAP
	Iris and Anterior Chamber			
OP6.6	Identify and demonstrate the clinical features and distinguish and diagnose common clinical conditions affecting the anterior chamber	1 hr		DOAP
OP6.10	Counsel patients with condition of iris and anterior chamber about their diagnosis , therapy and prognosis in an empathetic manner in a simulated environment			
	Lens			
OP7.3	Demonstrate the correct technique of ocular examination ina patient with cataract	1 hr		DOAP
OP7.5	To participate in team for cataract surgery	1 hr		DOAP
OP7.6	Administer informed consent and counsel			DOAP

	patient for cataract surgery in a simulated enviroment			
	Miscellaneous			
OP9.1	Demonstrate the correct technique the examine extraocular movements (uniocular& binocular)	1 hr		DOAP

UG CURRICULUM FOR SDL

TOPIC CODE	TOPIC	TOTAL NO. OF HOURS	INTEGRATION	METHOD OF TEACHING
Competency OP 4.5	Enumerate the causes of corneal blindness Enumerate the indications and types of keratoplasty	1ST Hour – Introduction 2nd Hour – symposium 3rd Hour - feedback Total : 3 hours		SDL
Competency OP 9.4	Enumerate , describe and discuss the causes of avoidable blindness and the NPCB (Including VISION 2020)	1st hour – Horizontal integration with community medicine 2nd hour – orientation 3rd hour- quiz Total : 3 hours	Horizontal integration with community medicine	SDL
Competency OP 6.7	Enumerate and discuss the aetiology, clinical features of various glaucomas associated with shallow and deep anterior chamber. Choose appropriate investigations and treatment for patients with above mentioned conditions	1st hour – Introduction/ Orientation 2nd hour – tutorials Total : 2 hours		SDL
Competency OP	Define , enumerate	1st hour –		SDL

1.5	the types and the mechanism by which strabismus leads to amblyopia	introduction 2nd hour – role play Total : 2 hours		

Suggested books :

1. Parson's text book of Ophthalmology
2. Kanski' s clinical Ophthalmology
3. Khurana's text book of Ophthalmology
4. Textbook of Ophthalmology, S.K Mittal (Thieme), 2021 edition

Internal Assessment

Subject – Ophthalmology

Applicable w.e.f batches admitted from 2019 and onwards

Phase		
	Theory	Practical
Second MBBS	-	EOP Practical Examination may be conducted. However, these marks shall not be added to the Internal Assessment.

3rd Year (III MBBS, PART I)						
Phase	**I-Exam (March)**			**II-Exam Prelim (August)**		
	Theory	Practical	Total Marks	Theory	Practical	Total Marks
III/I MBBS	50	50	100	100	100	200

Assessment in CBME is ONGOING PRCESS,

No Preparatory leave is permitted.

1. There shall be 2 internal assessment examinations in Ophthalmology including Prelim.

2. The suggested pattern of question paper for internal assessment internal examinations, except prelim examination is attached at the end. Pattern of the prelims examinations should be similar to the University examinations.

3. Internal assessment marks for theory and practical will be converted to out of 25 (theory) + 25 (practical). Internal assessment marks, after conversion, should be submitted to university within the stipulated time as per directives from the University. **Conversion Formula for calculation of marks in internal assessment examinations.**

	Theory	Practical
Phase II	**-**	**-**
Phase III/I	**150**	**150**
Total	**150**	**150**
Conversion out of	**25**	**25**
Conversion formula	**Total marks in 2 IA theory examinations /6**	**Total marks in 2 IA Practical examinations /6**
Eligibility criteria after conversion	**10**	**10**
	Combined theory + Practical = 25	

1. While preparing Final Marks of Internal Assessment, the rounding-off marks shall done as illustrated in following table.

Total Internal Assessment Marks	Final rounded marks
13.01 to 13.49	13
13.50 to 13.99	14

2. Students must secure at least 50% marks of the total marks (combined in theory and practical / clinical; not less than 40 % marks in theory and practical separately) assigned for internal assessment in order to be eligible for appearing at the final University examination of that subject.
3. Internal assessment marks will not to be added to marks of the University examinations and will be shown separately in mark list.

4. Remedial measures

A. Remedial measures for non-eligible students

i) At the end of each internal assessment examination, students securing less than 50% marks shall be identified. Such students should be counseled at the earliest and periodically. Extra classes for such students may be arranged.

ii) If majority of the students found to be weak in a particular area then extra classes must be scheduled for all such students. Even after these measures, if a student is failed to secure 50% marks combined in theory and practical (40% separately in theory and practical) after prelim examination, the student shall not be eligible for final examination.

iii) Non eligible candidates are offered to reappear for repeat internal assessment examination/s, which must be conducted 2 months before next University examination. The pattern for this repeat internal assessment examination shall be similar to the final University examination. The marks in this examination shall be considered for deciding the eligibility criteria. Following conversion formula shall be used for converting the marks.

	Theory	**Practical**
Remedial examination	**100**	**100**
Conversion out of	**25**	**25**
Conversion formula	**Marks in remedial theory examinations /4**	**Marks in remedial Practical examinations /4**
Eligibility criteria after conversion	**10**	**10**
	Combined theory + Practical = 25	

B. <u>Remedial measures for absent students:</u>

If any of the students is absent for any of the 2 IA examinations due to any reasons, following measures shall be taken.

i. The student is asked to apply to the academic committee of the college for reexamination, through HOD, to ascertain the genuineness of the reason for absentee.

ii. If permitted by academic committee, an additional examination for such students is to be conducted after prelims examination. Marks for such additional examination shall be equal to the missed examination.

iii. Even if a student has missed more than one IA examination, he/she can appear for only one additional IA examination. In such scenario, eligibility should be determined by marks obtained in internal assessment examinations for which the candidate has appeared, without changing the denominator.

Format for Practical Examinations

Ophthalmology

Internal Assessment Practical

Seat No.	Long case including communication skills	OSCE (2 stations of 5 marks each)	Viva including Dark room instruments, Operative instruments	Log book and Journal viva	Practical Total
Max Marks	20	10	10	10	50

OSCE Stations to include Signs of General examinations, Local examinations, Psychomotor skills and Communication skills., history taking of a particular symptom.

Prelims and MUHS Final Practical

Seat No.	Long case including communication skills	OSCE (4 stations)	Log book and Journal viva	Dark room instruments	Operative instruments	Practical & Oral
Max. Marks	50	20	10	10	10	100

*Communication skills to be assessed by Kalamazoo Consensus, clinical signs to be assessed by either GLOBAL Rating Scale or OSCE, Psychomotor Skills to be assessed by OSCE with checklist. If the skills are small, 2 or 3 skills may be combined.

Internal Assessment Theory Examination (I)

Ophthalmology

Instructions:

SECTION "A" MCQ

1) *Put ☒ in the appropriate box below the question number once only.*
2) *Use blue ball point pen only.*
3) *Each question carries **One mark.***
4) *Students will not be allotted mark if he/she overwrites strikes or put white ink on the cross once marked.*

SECTION "A" MCQ (10 Marks)

1. Multiple Choice Questions (Total 10 MCQ of One mark each) (1x10=10)

a) b) c) d) e) f) g) h) i) j)

Instructions:

1) *Use **blue/black** ball point pen only.*
2) ***Do not** write anything on the **blank portion of the question paper**. If written anything, such type of act will be considered as an attempt to resort to unfair means.*
3) ***All** questions are **compulsory**.*
4) *The number to the **right** indicates **full** marks.*
5) *Draw diagrams **wherever** necessary.*
6) *Use a common answer book for all sections.*

SECTION "B" (40 Marks)

2. Long Answer Questions structured clinical questions (15 x1=15)

a)

3.Short Answer Questions (Any 5 out of 6),(including 1 on AETCOM) (5 x 5=25)

a) b) c) d) e) f)

MUHS Final Theory Examination

Ophthalmology

MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES, NASHIK

FORMAT / SKELETON OF QUESTION PAPER

SECTION "A" MCQ

Instructions:

5) Put ☒ in the appropriate box below the question number once only.
6) Use blue ball point pen only.
*7) Each question carries **One mark.***
8) Students will not be allotted mark if he/she overwrites strikes or put white ink on the cross once marked.

SECTION "A" MCQ (20 Marks)

1. Multiple Choice Questions (Total 20 MCQ of One mark each) (1x20=20)

a) b) c) d) e) f) g) h) i) j)

k) l) m) n) o) p) q) r) s) t)

SECTION "B" & "C"

Instructions:

*1) Use **blue/black** ball point pen only.*
*2) **Do not** write anything on the **blank portion of the question paper**. If written anything, such type of act will be considered as an attempt to resort to unfair means.*
*3) **All** questions are **compulsory**.*
*4) The number to the **right** indicates **full** marks.*
*5) Draw diagrams **wherever** necessary.*
6) Use a common answer book for all sections.

SECTION "B" (40 Marks)

2. Long Answer Questions (Any 2 out of 3) structured clinical questions (15 x 2=30)

a) b) c)

3.Short Answer Questions (All 3),(including 1 on AETCOM) (5 x 3=15)

a) b) c)

SECTION C (40 Marks)

4 Long answer questions (15x1=15)

a)

5 Short answer questions(any 4 out of 5) (Clinical Reasoning) (5x4=20)

a) b) c) d) e)

College Logo

Name of the Institute

MUHS Logo

LOG BOOK

DEPARTMENT OF OPHTHALMOLOGY

CONTENTS

Sr.No.	Subject	Remarks
1	CERTIFICATE	
2	BIODATA OF THE CANDIDATE	
3	INTRODUCTION & OBJECTIVES OF CBME CURRICULUM	
4	SELF DIRECTED LEARNING / TUTORIALS / SEMINARS / EXTRA CURRICULAR ACTIVITIES	
5	CLINICAL SKILLS – LIST OF COMPETENCIES	
6	PSYCHOMOTOR SKILLS – LIST OF COMPETENCIES	
7	COMMUNICATION SKILLS – AETCOM	
8	PHASE III/I	
9	REFLECTION ON AETCOM MODULE	

LOGBOOK CERTIFICATE

This is to certify that this log book is the bonafide record of Mr. / Ms ..... Roll No……..Admission Year ……., of the Department of Ophthalmology at …….Medical College.

The log book is as per the guidelines of Competency Based Undergraduate Medical Education Curriculum, Graduate Medical Regulation 2019.

He / She has satisfactorily attended/ completed all assignments mentioned in this logbook as per the guidelines prescribed by National Medical Commission.

_____

Head of Department of Ophthalmology

Signature with Date

BIODATA OF THE CANDIDATE

PHOTO

Name of the student:

Name of the course: MBBS

Date of birth:

Father's / Guardian's name:

Mother's name:

Blood group:

Permanent Address:

……

…….

Temporary Address:

……

……..

Student's contact no:

Father's/guardian's contact no:

Student's mail id:

Father's/guardian's mail id:

Candidates Signature: …….. Date: .....

GENERAL INSTRUCTIONS

1) The log book is a record of the academic / nonacademic activities of the student. Each Medical student is responsible for maintaining their logbook.

2) This logbook is prepared as per the guidelines of NMC for implementation of Competency based curriculum for 3 RD Professional MBBS students in the subject of Ophthalmology.

3) Students are instructed to keep their logbook entries up to date. It is the responsibility of the student to enter their activity in respective pages & get them duly singed by the supervising faculty.

4) Entries in the logbook will be in accordance with activities done in the department & have to be scrutinized by the Head of the department.

5) The logbook assessment will be based on multiple factors like
   - Overall presentation
   - Active participation in the sessions
   - Quality of write up of reflections
   - Timely completions
   - Attendance

6) The logbook shall be kept as record work of the candidate for the department & be submitted to department as a bonafide record of the candidate before appearing for the University examination.

NOTE:

1. A **clear record** of all components that add to the internal assessment marks needs to be maintained by the institution and retained by them for at least **2 years** after passing of the examination. Institutions may be asked to provide these details by the University as and when required.

The contents in the log book are suggested guidelines. The institutions can make **necessary changes as per the needs**

ATTENDANCE

Every candidate should have attendance not less than 75% of the total classes conducted in theory, practical and clinical jointly in each calendar year calculated from the date of commencement of the term to the last working day as notified by the University in each of the subjects prescribed to be eligible to appear for the university examinations.

For appearing at the University Examination, student should have minimum 75% attendance in each subject.

A candidate lacking in the prescribed attendance in any subject(s) should not be permitted to appear for the examination in that subject(s)

Students cannot appear in part or separately in individual subjects during the first appearance at the Professional examination.

The Principal should notify the attendance details at the end of each professional phase without fail under intimation to this University.

Records of Internal Assessment Examinations

Sr. No.	Exam No.	Date	Theory	Date	Practical including Viva	Feedback provided	Signature of student	Signature of teacher
1	I Internal Assessment		----/50		----/50			
2	II Internal Assessment		----/50		----/50			
3	III Internal Assessment		----/100		----/100			
4	Calculation of Internal Assessment Marks		200/4		200/4			
5	Final Internal Assessment Marks (to be submitted to University)		50		50			

	Theory	**Practical**
Phase II	**50**	**50**
Phase III/I	**50**	**50**
Phase III/II	**100**	**100**
Total	**200**	**200**
Conversion	**50**	**50**

.....

Signature of Head of the Department

Self Directed Learning, Seminars, Tutorials, Projects, Quizzes, extracurricular activities

Sr. No.	Self Directed Learning, Seminars,Tutorials, Projects, Quizzes, extracurricular activities	Date	Phase III/I	Phase III/II	Signature of Teacher

Reflection (minimum 200 words) - 1

TOPIC : **DATE :**

Reflection (minimum 200 words) - 2

TOPIC : **DATE :**

LOGBOOK CLINICAL SKILLS : LIST OF COMPETENCIES

Clinical skills can be assessed by case presentation, case-based discussion, objective structured clinical assessment the checklist, MiniCex, Simulated patients as per the institutional preference.

RECORDING FORM FOR MINI – CEX

EVALUATOR : DATE :

STUDENT :

YEAR :

PATIENT DIAGNOSIS :

SETTINGS : AMBULATORY NEW COMPLEXITY : LOW

IN PATIENT FOLLOW UP MODERATE

ED HIGH

OTHER :

PATIENT AGE PATIENT SEX

FOCUS : DATA GATHERING / DIAGNOSIS / THERAPY / COUNSELLING

1. **MEDICAL INTERVIEWING SKILLS** (OBSERVED / NOT OBSERVED)

1 2 3 / 4 5 6 / 7 8 9

2. **PHYSICAL INTERVIEWING SKILLS** (OBSERVED / NOT OBSERVED)

1 2 3 / 4 5 6 / 7 8 9

3. **HUMANISTIC QUALITIES** / PROFFESIONALISM (OBSERVED / NOT OBSERVED)

1 2 3 / 4 5 6 / 7 8 9

4. **CLINICAL JUDGEMENT** (OBSERVED / NOT OBSERVED)

1 2 3 / 4 5 6 / 7 8 9

5. **COUNSELLING SKILLS** (OBSERVED / NOT OBSERVED)

1 2 3 / 4 5 6 / 7 8 9

6. **ORGANIZATION / EFFICIENCY** (OBSERVED / NOT OBSERVED)

1 2 3 / 4 5 6 / 7 8 9

7. **OVERALL CLINICAL COMPETENCE** (OBSERVED / NOT OBSERVED)

1 2 3 / 4 5 6 / 7 8 9

MINI CEX TIME : OBSERVING : _____ MINS

PROVIDING FEEDBACK _____ MINS

UNSATISFACTORY 1,2,3

SATISFACTORY 4, 5, 6

SUPERIOR 7, 8, 9

EVALUATOR SATISFACTION WITH MINI CEX

LOW 1 2 3 4 4 5 6 7 8 9 HIGH

RESIDENT SATISFACTION WITH MINI CEX

LOW 1 2 3 4 4 5 6 7 8 9 HIGH

COMMENTS :

STUDENT SIGNATURE EVALUATOR SIGNATURE

Competency # addressed	Name of Activity
OP1.2	Demonstrate the steps in performing the visual acuity assessment for distance vision,near vision,colour vision,the pin hole test ,the menace and blink reflexes
OP2.2	Demonstrate the symptoms and signs of lid conditions including hordeolum externum, blephritis,preseptal cellulitis,,dacryocystitis,dermoid ,ptosis, entropion,lid lag ,lagophthalmos
OP2.3	Demonstrate under supervision clinical procedures performed in the lid including Bell s phenomena assessment of entropion/ectrpion, regurgitation test, Creigler s massage, cilia removal by epilation
OP3.1	Elicit, document and present an appropriate history in a patient with a “red eye”including congestion,discharge and pain.
OP3.2	Demonstrate document and present the correct method of examination of a “red eye”incuding vision assessment ,corneal lustre, pupil abnormality, ciliary tenderness
OP3.8	Demonstrate the correct technique of removal of foreign body from the eye in a simulated environment
OP3.9	Demonstrate the correct technique of instillation of eye drops in a simulated environment
OP4.8	Demonstrate technique of removal of foreign body in the cornea in a simulated environment
OP6.6	Identify and Demonstrate the clinical features and distinguished diagnose common clinical conditions affecting the anterior chamber

OP7.3	Demonstrate the correct technique of ocular examination in a patient with a cataract
OP7.5	To participate in the team for cataract surgery
OP8.3	Demonstrate the correct technique of a fundus examination and describe and distinguish the funduscopic features in a normal condition and in conditions causing an abnormal retinal exam

LOGBOOK PSYCHOMOTOR / PERFORMANCE SKILLS :

Skills can be assessed by objective structured clinical assessment with checklist, Global Rating Scale, Simulated patients as per the institutional preference.

Colleges are instructed prepare modules for skill training as per NMC guidelines.

Module 5 Skill Training.

I – independent certification

D- demonstration

LIST OF COMPETENCIES

Competency # addressed	**Name of Activity**
	Perform basic surgical skill such as First Aid including suturing and minor surgical procedures in simulated environment
(I)	Eye patching (correct technique), Eye Bandaging (post-surgery)
(I)	Incision and Drainage

LOGBOOK FOR
AETCOM SKILLS

Counselling for Investigation, Treatment, Prognosis, Blood donation, Organ Donation, Breaking Bad news. All types of consent. Medicolegal aspects and Ethics, Empathy and professionalism as per the Phase of the MBBS. Include cases of Allied branches also.

Competency to be assessed during Clinical postings and /or small group discussions.

AetCom skills can be assessed by use of Kalamazoo consensus.

Criteria
Builds relationship
Opens the discussion
Gathers information
Understands the patient's perspective
Shares information
Manages flow
Overall rating
Signature of teacher

Communication skills rating scale adapted from Kalamazoo consensus statement

Rating 1-3 - Poor, 4 -6 Satisfactory, 6 -10 Superior

LIST OF COMPETENCIES-For AETCOM

Competency # addressed	Name of Activity
OP4.10	Counsel patients and families about the eye donation in a simulated environment
OP6.10	Counsel patients with conditions of the iris and anterior chamber about their diagnosis, therapy and prognosis in an empathetic manner in a simulated environment
OP 7.6	Administer informed consent and counsel patients for cataract surgery in a simulated environment

PHASE II-Clinical (minimum four assessment)

SR. No.	Competency # addressed	Name of Activity	Site Ward, skill lab, opd, casualty,	Date completed	Attempt at activity First (F) Repeat (R) Remedial (Re)	Rating Below (B) expectations Meets (M) expectations Exceeds (E) expectations OR Numerical Score	Decision of faculty Completed (C) Repeat (R) Remedial (Re)	Initial of faculty	Feedback received Initial of Learner	Method of assessment and Score
1.										
2.										
3.										
4.										
5.										
6.										

PHASE II-Psychomotor

SR. No.	Competency # addressed	Name of Activity	Site Ward, skill lab, opd , casualty,	Date completed	Attempt at activity First (F) Repeat (R) Remedial (Re)	Rating Below (B) expectations Meets (M) expectations Exceeds (E) expectations OR Numerical Score	Decision of faculty Completed (C) Repeat (R) Remedial (Re)	Initial of faculty	Feedback received Initial of Learner	Method of assessment and Score
1.										
2.										
3.										
4.										
5.										

PHASE II- AetCom

SR. No.	Competency # addressed	Name of Activity	Site Ward, skill lab, opd , casualty,	Date completed	Attempt at activity First (F) Repeat (R) Remedial (Re)	Rating Below (B) expectations Meets (M) expectations Exceeds (E) expectations OR Numerical Score	Decision of faculty Completed (C) Repeat (R) Remedial (Re)	Initial of faculty	Feedback received Initial of Learner	Method of assessment and Score
1.										
2.										
3.										

PHASE III Part I -Clinical (minimum four assessments)

SR. No.	Competency # addressed	Name of Activity	Site Ward, skill lab, opd , casualty,	Date completed	Attempt at activity First (F) Repeat (R) Remedial (Re)	Rating Below (B) expectations Meets (M) expectations Exceeds (E) expectations OR Numerical Score	Decision of faculty Completed (C) Repeat (R) Remedial (Re)	Initial of faculty	Feedback received Initial of Learner	Method of assessment and Score
1.										
2.										
3.										
4.										
5.										

6.										

PHASE III Part I-Psychomotor skill

SR. No.	Competency # addressed	Name of Activity	Site Ward, skill lab, opd , casualty,	Date completed	Attempt at activity First (F) Repeat (R) Remedial (Re)	Rating Below (B) expectations Meets (M) expectations Exceeds (E) expectations OR Numerical Score	Decision of faculty Completed (C) Repeat (R) Remedial (Re)	Initial of faculty	Feedback received Initial of Learner	Method of assessment and Score
1.										
2.										
3.										
4.										

5.										

PHASE III Part I - AetCom (Minimum Four assessments)

SR. No.	Competency # addressed	Name of Activity	Site Ward, skill lab, opd , casualty,	Date completed	Attempt at activity First (F) Repeat (R) Remedial (Re)	Rating Below (B) expectations Meets (M) expectations Exceeds (E) expectations OR Numerical Score	Decision of faculty Completed (C) Repeat (R) Remedial (Re)	Initial of faculty	Feedback received Initial of Learner	Method of assessment and Score
1.										
2.										
3.										

REFLECTION ON AETCOM MODULE

Reflection (minimum 200 words)-2 Date:

Module 4.6 - Case studies in ethics and the doctor-industry relationship

Competency addressed	Level	Assessment
Identify conflicts of interest in patient care and professional relationships and describe the correct response to these conflicts	SH	Participation in SDL and discussion

Signature of Teacher-in-charge

Pediatrics

Course Content

(Based on Medical Council of India,
Competency based Undergraduate curriculum for the Indian Medical Graduate, 2018. Vol. 2 / ~~3~~; page nos. 150-201)

1. Total Teaching hours: 105 hours (Lectures + Tutorials);
   15 hours (Self-directed learning);
   174 hours Clinical posting
2. A. Lectures(hours): 40(20 hours each in III MBBS Part I & Part II)
   B. Self-directed learning (hours): 15 (5 hours in III MBBS Part I & 10 hours in III MBBS Part II)

   C. Clinical Postings (hours): 174 (2 weeks/ 4 weeks/ 4 weeks)
   D. Small group teachings/tutorials/Integrated teaching/Practicals (hours)**:**
   65 hours (30 hours in III MBBS Part I and 35 hours in III MBBS Part II)

- 8 symposia will be conducted from theory topics in
  - 15 hours of Self-directed Learning (3 in III MBBS (Part I) and
  - 5 in III MBBS (Part II))
- Two (02) Full day workshops
  - IMNCI
  - NRP
- Module 4.7 AETCOM Module will be covered in III MBBS (Part II) (05 hours)

Tutorials/ Small Group Discussions III (Part I) MBBS (30 hours)

S. No	Topic	Hours	Lectures (Competency No.)	SLO	Horizontal Integration
1	Normal Growth and Development	01	Developmental milestones (PE 1.5, 1.6)	1. Definition of Development 2. Principals of development 3. Factors affecting Development 4. Domains of Development 5. Milestones in various domains	Psychiatry

				6. Developmental assessment	
2	Common problems related to growth	02	Failure to thrive (PE 2.1, 2.4)	1.Definition 2. Etiology 1. Clinical Features 2. Evaluation of a child with Failure to thrive 3. Management	
			Short stature (PE 2.6)	1. Definition 2. Etiology 3. Clinical Features 4. Evaluation of a child with Short stature 5. Management	
3.	Care of the Normal Newborn, and High-risk Newborn	02	Care of normal newborn (PE 20.1, 20.2, 20.6,)	1. Define the common neonatal nomenclatures including the classification 2. Describe the characteristics of a Normal Term Neonate and High-Risk Neonates. 3. Explain the care of a normal neonate	Obs & Gynae
			Temperature regulation and Neonatal hypothermia (PE 20.12)	1. Temperature regulation in neonates 2. Disorders of temperature regulation 3. Definition of hypothermia 4. Prevention of hypothermia 5. Clinical features of hypothermia 6. Management of hypothermia	
4.	To promote and support optimal Breast feeding for infants	01	Breast Feeding (PE 7.1, 7.2, 7.3, 7.4, 7.6)	1. Awareness on the cultural beliefs and practices of breast feeding. 2. Enumerate advantages of breast feeding 3. Explain the physiology of lactation. 4. Technique of breast feeding 5. Problems in breast feeding 6. Enumerate the baby friendly hospital initiatives 7. Describe the composition and types of breast milk 8. Discuss the differences between cow's milk and Human milk. 9. Discuss the advantages of breast milk. 10. Overview about expressed breast milk	Obs & Gynae
5.	Complementary Feeding	01	Complementary feeding and	1. Define the term Complementary Feeding. 2. Discuss the principles, the initiation,	

			IYCF (PE 8.1, 8.2, 8.3)	attributes, frequency, techniques and hygiene related to Complementary Feeding 3. IYCF 4. Enumerate the common complimentary foods	
6.	Provide nutritional support, assessment and monitoring for common nutritional problems	01	Protein Energy Malnutrition (PE 10.1, 10.2, 10.4, 10.6)	1. Define malnutrition 2. Classify malnutrition including WHO classification, 3. Describe the etio-pathogenesis, clinical features, complication of Severe Acute Malnourishment (SAM) and Moderate Acute Malnutrition (MAM). 4. Differentiate between kwashiorkor and marasmus 5. Outline the clinical approach to a child with SAM and MAM. 6. Management of a child with SAM and MAM. 7. Enumerate the role of locally prepared therapeutic diets and ready to use therapeutic diets. 8. Strategies to prevent malnutrition	
7.	Obesity in Children	01	Obesity (PE 11.1, 11.2, 11.6)	1. Define obesity 2. Describe the common etiology, clinical features and management of obesity in children. 3. Discuss the risk approach for obesity and criteria for referral 4. Discuss the prevention strategies	
8.	Micronutrients in health and disease 1: (Vitamins A,D,E,K, B Complex and C) Micronutrients in health and disease 2: Iron, Iodine,	04	Vitamin A Vitamin E, K (PE 12.1, 12.2, 12.4, 12.5, 12.11, 12.12, 12.13, 12.14)	**Vitamin A** 1. RDA, dietary sources of Vitamin A and their role in Health and disease. 2. Describe the causes, clinical features, diagnosis and management of Deficiency / excess of Vitamin A. 3. Discuss the Vitamin A prophylaxis program and their recommendations **Vitamin E** 1. Discuss the RDA, dietary sources of Vitamin E and their role in health and disease.	

	Calcium and Magnesium			2. Describe the causes, clinical features, diagnosis and management of deficiency of Vitamin E. **Vitamin K** 1. Discuss the RDA, dietary sources of Vitamin K and their role in health and disease. 2. Describe the causes, clinical features, diagnosis management and prevention of deficiency of Vitamin K	
			Vitamin B, C and Iodine deficiency disorders (PE 12.15, 12.16, 12.18, 12.19, 12.20, 13.7, 13.8, 13.10, 13.10)	**Vitamin B** 1. Discuss the RDA, dietary sources of Vitamin B and their role in health and disease 2. Describe the causes, clinical features, diagnosis and management of deficiency of B complex Vitamins. **Vitamin C** 1. Discuss the RDA , dietary sources of Vitamin C and their role in Health and disease 2. Describe the causes, clinical features, diagnosis and management of deficiency of Vitamin C (scurvy) **Iodine deficiency Disorder** 1. Discuss the RDA, dietary sources of Iodine and their role in Health and disease. 2. Describe the causes, clinical features, diagnosis and management of deficiency of Iodine. 3. Discuss the National Goiter Control program and their recommendations.	
			Iron deficiency anemia (PE 13.1, 13.2, 13.5, 13.6)	1. Discuss the RDA, dietary sources of Iron and their role in health and disease' 2. Describe the causes, clinical features,diagnosis and management of Fe deficiency 3. Discuss the National Anemia control program and its recommendations.	
			Vitamin D and Calcium & Magnesium deficiency (PE 12.6, 12.7,	**Vitamin D/Ca/Mg** 1. Discuss the RDA, dietary sources of Vitamin D and their role in health and disease. 2. Describe the causes, clinical features,	

			12.9, 12.10, 13.11, 13.12, 13.13, 13.14)	diagnosis and management of Deficiency / excess of Vitamin D (Rickets and Hypervitaminosis D). 3. Discuss the role of screening for Vitamin D deficiency 4. Discuss the RDA, dietary sources of Calcium and their role in health and disease 5. Describe the causes, clinical features, diagnosis and management of Ca Deficiency 6. Discuss the RDA, dietary sources of Magnesium and their role in health and disease**.** 7. Describe the causes, clinical features, diagnosis and management of Magnesium Deficiency	
29.	Anemia and other Hemato-oncologic disorders in children	02	Anemia (PE 29.1)	1. Definition 2. Etiopathogenesis 3. Classification 4. Approach to a child with anemia	
			Nutritional anemia (PE 29.2, 29.3, 29.5)	**Iron def anemia/ Megaloblastic anemia** 1. Etiopathogenesis 2. Clinical features 3. Lab investigations 4. Management 5. Discuss the National Anemia Control Program	
9.	Fluid and electrolyte balance	01	Fluid and electrolytes (PE 15.1, 15.2)	1. Composition of body fluids 2. Water balance and Osmolality 3. Normal maintenance fluid and electrolyte requirements 4. Sodium balance and its disorders 5. Potassium balance and its disorders 6. Overview of Acid-Base disorders	
10.	National Programs, RCH – Universal Immunizations program	02	Vaccines in children (PE 19.1, 19.2, 19.3, 19.4)	1. Components of the Universal Immunization Program and the National Immunization Program. 2. Epidemiology of Vaccine preventable diseases 3. Vaccine description with regard to classification of vaccines, strain used, dose, route, schedule, risks, benefits and side effects, indications and	

				contraindications. (BCG, OPV, IPV Hep B, DPT, Hib, MMR) 4. Define cold chain and discuss the methods of safe storage and handling of vaccines	
			Immunization in special situations and newer vaccines (PE 19.5, 19.16)	1. Immunization in special situations – HIV positive children, immunodeficiency, pre-term, organ transplants, those who received blood and blood products, splenectomised children, adolescents, travelers. 2. Enumerate available newer vaccines and their indications including pentavalent pneumococcal, rotavirus, JE, typhoid IPV & HPV. 3. Combination vaccines 4. AEFI	
11	Respiratory system	02	RTI GEM – I (PE 28.1, 28.2, 28.3, 28.4, 28.5, 28.6, 28.7, 28.8))	**Naso pharyngitis/ Pharyngo Tonsillitis/ Acute Otitis Media (AOM)** 1. Etio-pathogenesis 2. Clinical features 3. Management 4. Complications	
				Stridor/Epiglottitis/Acute laryngotracheobronchitis/Foreign Body Aspiration 1. Etiopathogenesis 2. Clinical features 3. Management	
			RTI GEM -II (PE 28.18)	**Bronchiolitis and wheeze associated LRTI/ Empyema/Lung Abscess** 1. Etio-pathogenesis 2. Clinical features 3. Diagnosis 4. Management 5. Prevention	
12.	Vaccine preventable Diseases& Tuberculosis	02	Fever &Exanthematous Fever (PE 34.14, 34.15)	1. Enumerate the common causes of fever 2. Etiopathogenesis 3. Clinical features 4. Complications 5. Management 6. Approach to a child with Exanthematous Fever	
			Measles, Mumps, Rubella &	1. Etiopathogenesis 2. Clinical features 3. Complications	

			Chicken pox (PE 34.15)	4. Management 5. Prevention 6. Measles, Mumps, Rubella & Chicken pox vaccines	
13.	Chromosomal Abnormalities	01	Down syndrome, Turner &Klinefelter syndrome (PE 32.1, 32.3, 32.4, 32.5, 32.6, 32.8, 32.9, 32.10, 32.11, 32.13)	1. Genetic basis 2. Risk factors 3. Clinical features 4. Complications 5. Prenatal diagnosis 6. Management 7. Genetic counselling.	General Medicine – PE 32.3, 32.9 Obs& Gynae – PE 32.9
14.	Diarrheal diseases and Dehydration	01	Diarrheal diseases & dehydration incl Persistent diarrhea, Chronic diarrhea and dysentery (PE 24.1, 24.2, 24.3, 24.4, 24.5, 24.6, 24.7, 24.8, 24.14)	1. Etio-pathogenesis 2. Classification 3. Clinical presentation 4. Management 5. Physiological basis of ORT 6. Types of ORS 7. Composition of various types of ORS 8. Classification and clinical presentation of various types of diarrheal dehydration 9. Types of fluid used in Pediatric diarrheal diseases and their composition 10. Role of antibiotics, antispasmodics, anti-secretory drugs, probiotics, anti-emetics in acute diarrheal diseases	
15.	Pediatric Emergencies – Common Pediatric Emergencies	02	Poisoning (PE 27.8, 14.1, 14.2, 14.3, 14.4)	1. Clinical approach to a child with suspected poisoning 2. **Common poisonings – Hydrocarbon/OP/PCM/Lead/Envenomation** 3. Etiopathogenesis 4. Clinical features 5. Lab investigations 6. Management	General Medicine
			Child abuse (PE 27.29)	1. Causes 2. Clinical presentation Medico-legal implications	
16.	Allergic Rhinitis, Atopic Dermatitis,	01	Allergy in children (PE 31.1, 31.3, 31.12)	**Allergic Rhinitis/Atopic Dermatitis/Urticaria Angioedema** 1. Etiology 2. Clinical features	

	Bronchial Asthma , Urticaria Angioedema			3. Management 4. Complications 5. Prevention	
17.	Adolescent health and common problems related to Adolescent Health.	01	Adolescence & Puberty (PE 6.10, 6.11)	1. Visit to the Adolescent Clinic. Discuss the objectives and functions of AFHS (Adolescent Friendly Health Services) and the referral criteria.	Psychiatry
18.	Common problems related to Development-1 (Developmental delay, Cerebral palsy)	01	Developmental delay (PE 3.5, 3.6, 3.7)	1. Visit a Child Developmental Unit and observe its functioning. Discuss the role of the child developmental unit in management of developmental delay. Discuss the referral criteria for children with developmental delay	
19.	Common problems related to Development-2 (Scholastic backwardness, Learning disabilities, Autism ADHD)	01	Scholastic backwardness and Learning Disabilities (LD) (PE 4.5, 4.6, 5.10,5.11)	1. Visit to child guidance clinic. Discuss the role of Child Guidance clinic in children with Developmental problems& Behavioral problems.	
TOTAL		**30**			

Theory III (Part I) MBBS (20 hours)

S. No	Topic	Hours	Lectures (Competency No)	SLO	Horizontal Integration
1.	Normal Growth and Development	01	Growth & Development (PE 1.1, 1.2, 1.3, 1.5)	1. Definition of Growth 2. Definition of Development 3. Physiology of Growth & Development 4. Normal Growth – Somatic and physical 5. Assessment of Growth	Psychiatry

				parameters; Growth charts 6. Factors affecting Growth & Development 7. Overview of disorders related to Growth & Development	
2.	Common problems related to Development-1 (Developmental delay, Cerebral palsy)	02	Developmental delay (PE 3.1, 3.2, 30.10)	1. Definition 2. Developmental delay vs Intellectual disability 3. Etiology 4. Clinical Features 5. Approach to developmental delay and ID 6. Prevention and management	
			Cerebral palsy (PE 3.8, 30.11)	1. Definition 2. Etiopathogenesis 3. Types of CP 4. Evaluation of a child with CP 5. Prevention and management	Physical Medicine & Rehabilitation
3.	Common problems related to Development-2 (Scholastic backwardness, Learning disabilities, Autism ADHD)	02	Scholastic backwardness and Learning Disabilities (LD) (PE 4.1, 4.2)	1. Causes of Scholastic backwardness 2. Approach to a child with Scholastic backwardness 3. Definition of LD 4. Types of LD and clinical features 5. Etiology 6. Approach to a child with LD and management	
			ADHD and Autism (PE 4.3, 4.4)	1. Etiology of ADHD 2. Clinical features of ADHD 3. Diagnosis and management of ADHD 4. Etiology of Autism 5. Clinical features of Autism 6. Diagnosis and management of Autism	
4.	Common problems related to behavior	01	Behavioral problems of children incl Enuresis & Encopresis (PE 5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 5.7, 5.8, 5.9)	1. Describe the clinical features, diagnosis and management of common behavioral problems like • Thumb sucking, • Feeding problems, • Nail biting • Breath Holding spells, • Pica,	Psychiatry

				• Fussy infant. 2. Definition of enuresis and encopresis 3. Differentiate between primary and secondary enuresis 4. Maturation of bowel and bladder control 5. Etiology of Enuresis and Encopresis 6. Clinical features of Enuresis and Encopresis 7. Management of Enuresis and Encopresis	
5.	Adolescent health and common problems related to Adolescent Health.	01	Adolescence & Puberty (PE 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7, 6.12, 6.13)	1. Define Adolescence 2. Stages of adolescence and SMR 3. Describe the physical, physiological and psychological changes during adolescence and Puberty. 4. Outline the general health problems during adolescence. 5. Describe adolescent sexuality and common problems related to it. 6. Explain the Adolescent Nutrition and common nutritional problems. 7. Outline the common Adolescent eating disorders (Anorexia Nervosa, Bulimia). 8. Describe the common mental health problems during adolescence. 9. Enumerate the importance of obesity and other NCD in adolescents. 10. Enumerate the prevalence and the importance of recognition of sexual drug abuse in adolescents and children.	Psychiatry
6.	Normal nutrition, assessment and monitoring.	01	Normal Nutrition (PE 9.1, 9.2, 9.3, 9.7)	1. Describe the age-related nutritional needs of infants, children and adolescents including micronutrients and	

				vitamins 2. Concept of RDA and balanced diet. 3. Describe the tools and methods for assessment and classification of nutritional status of infants, children and adolescents. 4. Explains the Calorific value of common Indian foods	
7.	Vaccine preventable Diseases& Tuberculosis	8	Tuberculosis in children (PE 34.1, 34.2, 34.12, 34.13)	1. Epidemiology 2. Clinical features and clinical types 3. Complications of Tuberculosis 4. Diagnostic tools for childhood tuberculosis. 5. Indications and discuss the limitations of methods of culturing M. Tuberculosis. 6. Newer diagnostic tools for Tuberculosis including BACTEC CBNAAT and their indications	Respiratory Medicine
			Management of tuberculosis (PE 34.3, 34.4)	1. Various regimens for management of Tuberculosis as per National Guidelines. 2. Preventive strategies adopted and the objectives and outcome of the National Tuberculosis Control Programme	Respiratory Medicine
			Diphtheria, Pertussis, Tetanus (PE 34.16)	1. Etiopathogenesis 2. Clinical features 3. Complications 4. Management 5. Prevention 6. Diphtheria, Pertussis, Tetanus vaccines	
			Enteric fever (PE 34.17)	1. Etiopathogenesis 2. Clinical features 3. Complications 4. Management 5. Prevention 6. Typhoid vaccines	
			Rickettsial diseases (PE 34.20)	1. Etiopathogenesis 2. Clinical features 3. Complications 4. Management 5. Prevention	
			Parasitic infections	**Common Parasitic infections - leishmaniasis, filariasis, helminthic**	

			(PE 34.19)	**infestations, amebiasis, giardiasis** 1. Etiopathogenesis 2. Clinical features 3. Complications 4. Management 5. Prevention	
			Malaria (PE 34.19)	1. Etiopathogenesis 2. Clinical features 3. Complications 4. Management 5. Prevention **6.** National Malaria Eradication Programme	
			Dengue Fever (PE 34.18)	1. Etiopathogenesis 2. Clinical features 3. Complications 4. Management 5. Prevention 6. Overview of Chikungunya	
8.	Systemic Pediatrics-Central Nervous system	01	Acute Flaccid Paralysis (AFP) and Poliomyelitis (PE 30.13)	1. Etiology 2. Approach to a child with AFP 3. Evaluation 4. Management 5. AFP Surveillance	
9.	Endocrinology	03	Hypothyroidism (PE 33.1)	1. Physiology of thyroid gland 2. Thyroid function test 3. Etiology 4. Congenital vs Acquired 5. Clinical features 6. Evaluation 7. Management 8. New-born Screening	
			Diabetes mellitus in children and DKA (PE 33.4)	1. Etiopathogenesis 2. Diagnostic criteria 3. Classification 4. Clinical features 5. Management 6. Complications incl DKA	
			Disorders of puberty (PE 33.8)	**Precocious and delayed Puberty** 1. Definition 2. Etiology 3. Clinical Features 4. Evaluation 5. Management	
TOTAL		**20**			

Self-Directed Learning III (Part I) MBBS (05 hours)

S. No	Topic	Hours	Lectures (Competency No.)	SLO	Horizontal Integration
1.	The National Health Programs, NHM The National Health Programs, RCH	02	National programs pertaining to maternal & child health, child survival & safe motherhood (PE 17.1, 17.2, 18.1, 18.2)	1. State the vision and outline the goals, strategies and plan of action of NHM and other important national programs pertaining to maternal and child health including RMNCH A+, RBSK, RKSK, JSSK mission Indra Dhanush and ICDS. 2. List and explain the components, plan, outcome of Reproductive Child Health (RCH) program and appraise its monitoring and evaluation 3. Explain preventive interventions for child survival and safe motherhood	Obs & Gynae
TOTAL		**02**			

Tutorials/ Small Group Discussions III (Part II) MBBS (35 hours)

S. No	Topic	Hours	Domain (Competency No.)	SLO	Horizontal Integration
1	Group Discussions	01	Fluids & Electrolytes, Nutrition (PE 15.3, 15.4, 15.5, 9.5)	1. Calculate fluid and electrolyte imbalance, Interpret electrolyte report, 2. Calculate the fluid and electrolyte requirement in health 3. Plan an appropriate diet in health & disease	
		01	Cardiac Failure (PE 23.11, 23.16, 23.17, 23.18)	1. Develop a treatment plan and prescribe appropriate drugs including fluids in cardiac diseases, anti -failure drugs, and inotropic agents. 2. Discuss the indications and limitations of Cardiac catheterization. 3. Enumerate some common cardiac surgeries like BT shunt, Potts and Waterston's and corrective surgeries 4. Demonstrate empathy while dealing with cardiac disease.	
		01	Oxygen Therapy (PE 27.9, 27.10, 14.5)	1. Discuss oxygen therapy in Pediatric emergencies and modes of administration. 2. Observe the various methods of administering Oxygen. 3. Discuss oxygen toxicity and free radical injury	
		01	Counselling (PE 2.3, 3.4, 8.5, 27.32, 27.33, 28.20)	1. Counselling a parent with failing to thrive child 2. Counselling a parent with developmental delay 3. Counsel & educate mothers on the best practices in complimentary feeding 4. Obtain Informed Consent.	

				5. Counsel parents of dangerously ill/terminally ill child to break bad news 6. Counsel the child with asthma on the correct use of inhalers in a simulated environment	
		01	Hemat (PE 29.18, 29.20)	1. Enumerate the referral criteria for Hematological conditions. 2. Enumerate the indications for splenectomy and precautions	
2.	Radiology	01	X-Ray/USG/Neuroimaging (PE 21.12, 21.13, 23.12, 26.9, 28.17, 30.21, 30.22, 31.9, 34.8)	1. Interpret report of Plain X Ray of KUB 2. Enumerate the indications for and Interpret the written report of Ultra sonogram of KUB 3. Interpret a chest X ray and recognize Cardiomegaly 4. Interpret Liver USG 5. Interpret X-ray of the paranasal sinuses and mastoid; and /or use written report in case of management 6. Interpret CXR in foreign body aspiration and lower respiratory tract infection, understand the significance of thymic shadow in pediatric chest X-rays 7. Enumerate the indication and limitations &Interpret the reports of CT, MRI Brain & Spine 8. Interpret CX Ray in Asthma 9. Interpret a Chest Radiograph in pediatric TB	
3.	Cards (Case Scenario based)	01	(PE 21.11, 23.13, 23.14. 24.13, 26.9, 26.11, 28.16, 29.14, 19.15, 29.16, 30.20, 30.21, 30.22, 33.3, 33.6, 33.9, 34.9, 34.10)	1. Interpret Hemogram and Iron Panel 2. interpret the common analytes in a Urine examination 3. Interpret Pediatric ECG 4. Choose and Interpret blood reports in Cardiac illness 5. Interpret RFT and electrolyte report 6. Interpret Liver Function Tests,	

				viral markers. 7. Enumerate indications of UGI Endoscopy 8. Interpret blood tests relevant to upper respiratory problems. 9. Interpret CBC, LFT in anemia 10. Perform and interpret peripheral smear 11. Discuss the indications for Hemoglobin electrophoresis and interpret report 12. Interpret and explain the findings in a CSF analysis 13. Interpret and explain neonatal thyroid screening report 14. Perform and interpret Urine Dip Stick for Sugar. Interpret Blood sugar reports and explain the diagnostic criteria for Type 1 Diabetes 15. Interpret the reports of EEG 16. Perform Sexual Maturity Rating (SMR) and interpret 17. Interpret blood tests in the context of laboratory evidence for tuberculosis. Discuss the various samples for demonstrating the organism e.g. Gastric Aspirate, Sputum, CSF, FNAC.	
4.	Skills Lab	02	(PE 15.6, 15.7, 19.9, 19.13, 20.3, 24.15, 24.16, 24.17, 26.10, 27.20, 29.17, 30.23)	1. Demonstrate the steps of inserting an IV cannula in a model 2. Demonstrate the steps of inserting an interosseous line in a mannequin 3. Demonstrate the correct administration of different vaccines in a mannequin. 4. Describe the components of safe vaccine practice – Patient education/ counselling; adverse events following immunization, safe injection practices, documentation and Medico-legal implications 5. Perform Neonatal resuscitation	AETCOM – PE 19.9

				in a manikin 6. Perform NG tube insertion in a manikin 7. Perform IV cannulation in a model 8. Demonstrate the technique of liver biopsy or perform Liver Biopsy in a simulated environment. 9. Demonstrate performance of bone marrow aspiration in manikin 10. Perform in a mannequin lumbar puncture. Discuss the indications, contraindication of the procedure	
5.	Genito-Urinary system	02	Hypertension in children (PE 21.17)	1. Definition 2. Etiopathogenesis 3. Grading 4. Clinical features 5. Management 6. Complications 7. Acute severe hypertension	
			Voiding Disorders (PE 21.15)	1. Discuss & Enumerate the referral criteria for children with genitourinary disorder 2. Counsel & educate patients regarding referral	
6.	Cardiovascular system: Heart disease	04	Congestive cardiac failure in infants and children (PE 23.3)	1. Etiology 2. Pathogenesis 3. Clinical presentation 4. Management	
			Acyanotic congenital heart diseases (PE 23.1)	**VSD, ASD and PDA** 1. Etiology 2. Hemodynamic changes 3. Clinical features 4. Investigations 5. Management	
			Cyanotic congenital heart diseases (PE 23.2)	1. Classify Cyanotic congenital heart disease **Fallot's Physiology** 2. Etiology 3. Hemodynamic changes 4. Clinical features 5. Investigations	

				6. Management	
			Acquired Heart Disease (PE 23.4, 23.5, 23.6)	**Infective endocarditis** 1. Etio-pathogenesis 2. Clinical features 3. Diagnosis 4. Management **Acute rheumatic fever** 1. Etio-pathogenesis 2. Clinical features 3. Diagnosis 4. Management and prevention 5. Complications	
7.	Pediatric Emergencies – Common Pediatric Emergencies	03	Shock in children (PE 27.5)	1. Definition 2. BP regulation 3. Pathophysiology 4. Classification 5. Monitoring 6. Management	
			Status epilepticus (PE 27.6, 30.9)	1. Definition 2. Etiology 3. Approach to a child with status epilepticus 4. Evaluation 5. Management	
			Unconscious child and Coma (PE 27.8)	1. Definition 2. Etiopathogenesis 3. Evaluation 4. Management 5. Brain death	
8.	Care of the Normal Newborn, and High-risk Newborn	04	Care of low birth weight (LBW) babies (PE 20.11)	1. Definition 2. Etiology 3. Explain the terminologies – IUGR/SGA 4. Clinical features 5. Issues in LBW care 6. Feeding in LBW babies 7. Management of LBW babies 8. Growth monitoring of LBW babies	
			Neonatal hypoglycemia & hypocalcemia (PE 20.13, 20.14)	**Hypoglycemia and hypocalcemia** 1. Definition 2. Etiology 3. Clinical features 4. Management	
			Neonatal Seizures (PE 20.15)	1. Etiology 2. Clinical features 3. Management	

			Perinatal infections (PE 20.17)	TORCH/Tuberculosis/Hep B/Varicella 1. Etiology 2. Transmission 3. Clinical features 4. Management	
9.	Anemia and other Hemato-oncologic disorders in children	02	Hemolytic anemia (PE 29.4)	1. Etiology 2. Classification 3. Approach to a child with hemolytic anemia 4. Management 5. Overview of HS, AIHA and HUS	
			Thalassemia and Sickle Cell Anemia (PE 29.4)	1. Etiology 2. Clinical features 3. Lab investigations 4. Management incl Iron Chelation therapy 5. Complications	
10.	Acute and chronic liver disorders	02	Acute liver disease & Fulminant hepatic failure (PE 26.1, 26.2)	**Acute hepatitis in children – Viral (Hep A,B,C), Autoimmune and Wilsons disease** 1. Etio-pathogenesis 2. Clinical features 3. Management **Fulminant Hepatic Failure in children** 1. Etio-pathogenesis 2. Clinical features 3. Management	
			Chronic liver disease & Portal hypertension (PE 26.3, 26.4, 26.11, 26.12)	**Chronic liver diseases in children** 1. Etio-pathogenesis 2. Clinical features 3. Evaluation 4. Complications – hepatic encephalopathy and ascites 5. management **Portal Hypertension in children** 1. Etio-pathogenesis 2. Clinical features 3. Management 4. Complications	
11.	Respiratory system	01	Pneumonia and ARDS (PE 27.3, 27.4)	1. Etio-pathogenesis 2. Clinical features 3. Diagnosis 4. Management	

				5. Prevention	
4.	Malabsorption	01	Malabsorption (PE 25.1)	1. Etio-pathogenesis 2. Clinical presentation 3. Management 4. Overview of celiac disease	
TOTAL		**28**			

Theory III (Part II) MBBS (20 hours)

S. No	Topic	Hours	Lectures (Competency No.)	SLO	Horizontal Integration
1.	Care of the Normal Newborn, and High-risk Newborn	05	Birth asphyxia (PE 20.7)	1. Definition 2. Etiology 3. Clinical features 4. Management **5.** Prevention	
			Respiratory distress in newborn (PE 20.8)	**RDS/TTNB/MAS** 1. Etiology 2. Clinical features incl scoring systems 3. Management	
			Birth injuries &Hemorrhagic disease of newborn (HDN) (PE 20.9, 20.10)	**Birth Injuries** 1. Etiology 2. Clinical features 3. Management **HDN** 1. Definition and classification 2. Etiology 3. Clinical features 4. Management 5. Prevention	
			Neonatal Sepsis (PE 20.16)	1. Classification 2. Etiology 3. Clinical features 4. Investigations **5.** Management	
			Surgical conditions in newborn (PE 20.20)	TEF, esophageal atresia, anal atresia, cleft lip and palate, congenital diaphragmatic hernia 1. Etiology 2. Clinical presentation 3. Management 4. Causes of acute abdomen in	

				neonates	
2.	Genito-Urinary system	03	UTI (PE 21.1)	1. Etiology and predisposing factors 2. Clinical features 3. Diagnosis 4. Management 5. VUR	
			Approach to hematuria& Acute glomerulonephritis (PE 21.2, 21.4)	Hematuria 1. Definition 2. Diagnostic evaluation 3. Referral criteria Acute Glomerulonephritis 1. Definition 2. Etiology 3. Clinical features of PSGN 4. Management of PSGN 5. Complications	
			Acute kidney injury (AKI) and Chronic kidney disease (CKD) (PE 21.5, 21.6)	1. Definition and classification 2. Etiology and pathophysiology 3. Approach to a child with AKI 4. Management 5. Complications 6. Renal replacement therapy	
3.	Approach to and recognition of a child with possible rheumatologic problem	02	Approach to Rheumatological Problems incl JIA and SLE (PE 22.1)	1. Enumerate the common Rheumatological problems in children. 2. Approach to a child with arthritis 3. Referral criteria for a child with possible rheumatologic problem **JIA/SLE** 1. Definition 2. Etiopathogenesis 3. Clinical subtypes/Clinical features 4. Diagnosis 5. Management	
			Vasculitic disorders in children (PE 22.3)	Enumerate common Vasculitic disorders in children and its classification **Kawasaki disease/HSP** 1. Etiology 2. Clinical features 3. Diagnosis 4. Management	
4.	Anemia and other Hemato-	02	Thrombocytopenia and Hemophilia (PE 29.6, 29.7)	**Thrombocytopenia** **1.** Causes of thrombocytopenia **2.** Etiology of ITP	

	oncologic disorders in children			**3.** Clinical features and management of ITP **Hemophilia** **1.** Approach to a child with bleeding disorder **2.** Etiology and types of hemophilia 3. Clinical features and management of hemophilia	
			Leukemia, Lymphomas and Solid Tumors in children (PE 29.8, 29.9, 21.17)	**ALL/Lymphoma/Wilm'sTumor** 1. Etiology 2. Clinical features **3.** Management	
5.	Systemic Pediatrics-Central Nervous system	08	Meningitis in children (PE 30.1, 30.2)	1. Etio pathogenesis 2. Clinical features 3. Lab investigations 4. Management 5. Prevention 6. Differentiate between Bacterial, Viral and TB Meningitis **7.** Approach to a child with acute febrile encephalopathy	
			Hydrocephalus (PE 30.3)	1. Etio pathogenesis 2. Clinical features 3. Investigations 4. Complications 5. Management 6. Overview of IIH	
			Microcephaly and Neural tube defects (PE 30.4, 30.5)	1. Etio pathogenesis 2. Classification/Types 3. Clinical features 4. Complications 5. Management	
			Infantile hemiplegia/ Stroke (PE 30.6)	1. Etio pathogenesis 2. Clinical features 3. Investigations 4. Management	
			Epilepsy in children (PE 30.8)	1. Definition 2. Pathogenesis 3. Types of Epilepsy 4. Clinical presentation 5. Management 6. Overview of status epilepticus	
			Muscular	**DMD/BMD**	

			dystrophy (PE 30.14)	1. Etiology 2. Clinical features 3. Differential diagnosis 4. Evaluation 5. Management	
			Ataxia in children (PE 30.15)	1. Definition 2. Etiology 3. Clinical features 4. Differential Diagnosis 5. Management	
			Approach to headache in children (PE 30.16)	1. Pathophysiology of headache 2. Approach to a child with headache 3. Types of Headache 4. Management	
TOTAL		**20**			

Self-Directed Learning III (Part II) MBBS (10 hours)

S. No	Topic	Hours	Lectures (Competency No.)	SLO	Horizontal Integration
1.	Systemic Pediatrics-Central Nervous system	04	Floppy infant (PE 30.12)	1. Etiology 2. Clinical features 3. Differential diagnosis 4. Evaluation **5.** Management	
			Febrile seizures (PE 30.7)	1. Definition 2. Types 3. Etio pathogenesis 4. Clinical features 5. Investigations 6. Complications 7. Management	
2.	Care of the Normal Newborn, and High-risk Newborn	02	Neonatal hyperbilirubinemia (PE 20.19)	1. Physiological vs pathological jaundice 2. Etiology 3. Clinical features 4. Approach to a neonate with jaundice 5. Management 6. Follow-up	
3.	Genito-Urinary system	02	Approach to Proteinuria &Nephrotic	Proteinuria 1. Definition 2. Diagnostic evaluation	

			syndrome (PE 21.3)	3. Referral criteria Nephrotic Syndrome 1. Definition 2. Etiology 3. Terminologies – Remission/Relapse/Steroid dependence/Steroid resistance 4. Clinical features 5. Management 6. Complications 7. SDNS/SRNS/Congenital nephrotic syndrome	
4.	Respiratory system	02	Asthma in children (PE 28.19, 28.20, 31.5, 31.7, 31.8, 31.10)	1. Pathophysiology incl Triggers 2. Clinical features 3. Diagnosis and differential diagnosis 4. Management 5. Inhalational therapy 6. Monitoring and modification of treatment 8. Management of acute exacerbation of bronchial asthma	
TOTAL		**10**			

Internal Assessment

Subject – Pediatrics

Applicable w.e.f October 2020 onwards examination for batches admitted from June 2019 onwards

Phase		
	Theory	Practical
Second MBBS	-	EOP Practical Examination may be conducted. However, these marks shall not be added to the Internal Assessment.

3rd Year (III MBBS, PART I)

Phase	I-Exam (January)			II-Exam (April)		
	Theory	Practical	Total Marks	Theory	Practical	Total Marks
III/I MBBS	50	50	100	50	50	100

4th Year (III MBBS, PART II)

Clinical posting- 4 weeks

Theory- lectures- 20, tutorials- 35, self-directed learning-10. Total 65 hrs

Phase	III-Exam (May)			IV-Exam (Preliminary examination) (November)		
	Theory	Practical	Total Marks	Theory	Practical	Total Marks
III/II MBBS	50	50	100	100	100	200

Assessment in CBME is ONGOING PRCESS,

No Preparatory leave is permitted.

1. There shall be 4 internal assessment examinations in Pediatrics including Prelim.

2. The suggested pattern of question paper for internal assessment examinations, except prelim examination is attached at the end. Pattern of the prelims examinations should be similar to the University examinations.

3. Internal assessment marks for theory and practical will be converted to out of 25 (theory) + 25 (practical). Internal assessment marks, after conversion, should be submitted to university within the stipulated time as per directives from the University. **Conversion Formula for calculation of marks in internal assessment examinations.**

	Theory	**Practical**
Phase II	**-**	**-**
Phase III/I	**100**	**100**
Phase III/II	**150**	**150**
Total	**250**	**250**
Conversion out of	**25**	**25**
Conversion formula	**Total marks in 4 IA theory examinations /10**	**Total marks in 4 IA Practical examinations /10**
Eligibility criteria after conversion	**10**	**10**
	Combined theory + Practical = 25	

1. While preparing Final Marks of Internal Assessment, the rounding-off marks shall done as illustrated in following table.

Total Internal Assessment Marks	Final rounded marks
13.01 to 13.49	13
13.50 to 13.99	14

2. Students must secure at least 50% marks of the total marks (combined in theory and practical / clinical; not less than 40 % marks in theory and practical separately) assigned for internal assessment in order to be eligible for appearing at the final University examination of that subject.

3. Internal assessment marks will not to be added to marks of the University examinations and will be shown separately in mark list.

4. Remedial measures

A. Remedial measures for non-eligible students

i) At the end of each internal assessment examination, students securing less than 50% marks shall be identified. Such students should be counseled at the earliest and periodically. Extra classes for such students may be arranged.

ii) If majority of the students found to be weak in a particular area then extra classes must be scheduled for all such students. Even after these measures, if a student is failed to secure 50% marks combined in theory and practical (40% separately in theory and practical) after prelim examination, the student shall not be eligible for final examination.

iii) Non eligible candidates are offered to reappear for repeat internal assessment examination/s, which must be conducted 2 months before next University examination. The pattern for this repeat internal assessment examination shall be similar to the final University examination. The marks in this examination shall be considered for deciding the eligibility criteria. Following conversion formula shall be used for converting the marks.

	Theory	Practical
Remedial examination	**100**	**100**
Conversion out of	**25**	**25**
Conversion formula	**Marks in remedial theory examinations /4**	**Marks in remedial Practical examinations /4**
Eligibility criteria after conversion	**10**	**10**
	Combined theory + Practical = 25	

B. <u>Remedial measures for absent students:</u>

If any of the students is absent for any of the 4 IA examinations due to any reasons, following measures shall be taken.

i. The student is asked to apply to the academic committee of the college for reexamination, through HOD, to ascertain the genuineness of the reason for absentee.

ii. If permitted by academic committee, an additional examination for such students is to be conducted after prelims examination. Marks for such additional examination shall be equal to the missed examination.

iii. Even if a student has missed more than one IA examination, he/she can appear for only one additional IA examination. In such scenario, eligibility should be determined by marks obtained in internal assessment examinations for which the candidate has appeared, without changing the denominator.

Internal Assessment Practical Examinations

Pediatrics

Internal Assessment Practical – I, II and III

Subject: Pediatrics Practical (IA – I, II and III)				
Case	OSCE 1	OSCE 2	Journal & log book	Practical Total marks
20	10	10	10	50

OSCE Stations to include Signs of General examinations, Local examinations, Psychomotor skills and Communication skills., history taking of a particular symptom; nutrition history, developmental history, immunization history.

Prelim Practical

Subject: Pediatrics Practical (Prelims)					
Long Case (Including clinical skills demonstration)	Short Case (Including communication skills)	OSCE (4 stations x 10 marks each)	Viva	Journal & log book	Practical Total marks
25	15	40	10	10	100

OSCE 1 – Clinical Skills , OSCE 2 – Anthropometry assessment, OSCE 3 – Certifiable procedural skills , OSCE 4 – AETCOM related skills

MUHS Final Practical

Subject: Pediatrics Practical (Prelims)				
Long Case (Including clinical skills demonstration)	Short Case (Including communication skills)	OSCE (4 stations x 10 marks each)	Viva	Practical Total marks
30	20	40	10	100

OSCE 1 – Clinical Skills , OSCE 2 – Anthropometry assessment, OSCE 3 – Certifiable procedural skills , OSCE 4 – AETCOM related skills

Internal Assessment Examination (I, II and III) Pediatrics

SECTION "A" MCQ

Instructions:

1) *Put ☐ in the appropriate box below the question number once only.*
2) *Use blue ball point pen only.*
3) *Each question carries **One mark.***
4) *Students will not be allotted mark if he/she overwrites strikes or put white ink on the cross once marked.*

SECTION "A" MCQ (10 Marks)

1. Multiple Choice Questions (Total 10 MCQ of One mark each) (_10_x_1_=_10__)

a) b) c) d) e) f) g) h) i) j)

SECTION "B" & "C"

Instructions:

1) *Use **blue/black** ball point pen only.*
2) ***Do not** write anything on the **blank portion of the question paper**. If written anything, such type of act will be considered as an attempt to resort to unfair means.*
3) ***All** questions are **compulsory**.*
4) *The number to the **right** indicates **full** marks.*
5) *Draw diagrams **wherever** necessary.*
6) *Use a common answerbook for all sections.*

SECTION "B" (20 Marks)

2 Short Answer Questions (Five marks each) (Any 5 out of 6) (5x5= 25)

a) b) c) d) e) f)

3 Long Answer Questions (15x1=15)

a)

MUHS Final Theory Examination

Paediatrics

MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES, NASHIK

FORMAT / SKELETON OF QUESTION PAPER

SECTION "A" MCQ

Instructions:

5) Put ☐ in the appropriate box below the question number once only.
6) Use blue ball point pen only.
*7) Each question carries **One mark.***
8) Students will not be allotted mark if he/she overwrites strikes or put white ink on the cross once marked.

SECTION "A" MCQ (20 Marks)

1. Multiple Choice Questions (Total 20 MCQ of One mark each) (1x20=20)

a) b) c) d) e) f) g) h) i) j)

k) l) m) n) o) p) q) r) s) t)

SECTION "B" & "C"

Instructions:

*1) Use **blue/black** ball point pen only.*
*2) **Do not** write anything on the **blank portion of the question paper**. If written anything, such type of act will be considered as an attempt to resort to unfair means.*
*3) **All** questions are **compulsory**.*
*4) The number to the **right** indicates **full** marks.*
*5) Draw diagrams **wherever** necessary.*
6) Use a common answer book for all sections.

SECTION "B" (40 Marks)

2. Long Answer Questions (Any 2 out of 3) structured clinical questions (15 x 2=30)

a) b) c)

3.Short Answer Questions (All 3),(including 1 on AETCOM) (5 x 3=15)

a) b) c)

SECTION C (40 Marks)

4 Long answer questions (15x1=15)

a)

5 Short answer questions(any 4 out of 5) (Clinical Reasoning) (5x4=20)

a) b) c) d) e)

Journal of Paediatrics

College Logo	NAME OF THE COLLEGE **DEPARTMENT OF PAEDIATRICS**	MUHS,Nasik Logo

Journal of Paediatrics

Name of the Student: - _____

Batch Year: - _____

Roll No. :- _____

Phase: II (Year-)

Phase: III-I (Year-)

Phase: III-II (Year-)

College Logo	NAME OF THE COLLEGE **DEPARTMENT OF PAEDIATRICS**	MUHS,Nasik Logo

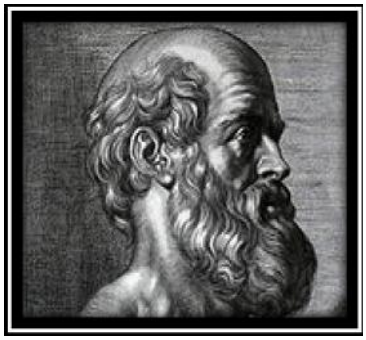
POSTING CERTIFICATE

Date- / /

Term	From	To	Absent days	Case- Histories Written	Skills achieved	Remark	Signatureof Unit Head
Phase: II (2 weeks)							
Phase:III-I (4 weeks)							
Phase: III-II (4 weeks)							
Date- Name of college- Seal-				- Signature- Professor and Head Department of Paediatrics.			

Note-

- Students must get the signature of the Unit In charge when posting is completed.
- This certificate must be submitted before every Internal assessment and Preliminary examination.
- Completed Record is Mandatory for appearing for the Final Examination.



HIPPOCRATIC OATH

"I swear by Apollo, the healer, Asclepius, Hygieia, and Panacea, and I take to witness all the gods, all the goddesses, to keep according to my ability and my judgment, the following Oath and agreement:

To consider dear to me, as my parents, him who taught me this art; to live in common with him and, if necessary, to share my goods with him; To look upon his children as my own brothers, to teach them this art; and that by my teaching, I will impart a knowledge of this art to my own sons, and to my teacher's sons, and to disciples bound by an indenture and oath according to the medical laws, and no others.

I will prescribe regimens for the good of my patients according to my ability and my judgment and never do harm to anyone.

I will give no deadly medicine to any one if asked, nor suggest any such counsel; and similarly I will not give a woman a pessary to cause an abortion.

But I will preserve the purity of my life and my arts.

I will not cut for stone, even for patients in whom the disease is manifest; I will leave this operation to be performed by practitioners, specialists in this art.

In every house where I come I will enter only for the good of my patients, keeping myself far from all intentional ill-doing and all seduction and especially from the pleasures of love with women or men, be they free or slaves.

All that may come to my knowledge in the exercise of my profession or in daily commerce with men, whom ought not to be spread abroad, I will keep secret and will never reveal.

If I keep this oath faithfully, may I enjoy my life and practice my art, respected by all humanity and in all times; but if I swerve from it or violate it, may the reverse be my life.

MEDICAL STUDENT

"The medical student must exhibit a calm and generous disposition, besides being virtuous and of noble mind.

He must be tolerant of others and exhibit patience and perseverance in his academic pursuits.

Although of sharp intellect, he must be both rotational and modest.

He should possess a pleasant appearance and good looks, well-proportioned body which should free from physical defect or obvious diseases.

Above all, he must be compassionate.

He must exhibit deep interest in the art and science of healing.

He must use his intelligence to discuss facts about the disease and to understand the clinical significance of symptoms.

Such knowledge he must use not only for his own intellectual enrichment, but also for acquiring requisite skills in practical management.

He must be humble and loyal to his teachers and instructors.

He should be free from any addictions, greed, arrogance, and intolerance."

- Charaka Samhita (1000 BC)

Sequence of workbook

No	Topic	Page no.
	Hippocratic Oath	-
	Medical Students	-
1	General instructions	07
2	Index	08
3	Templates	
A.	Long Case	10
B.	Short Case	15
C.	Newborn	19
D.	Immunisation Clinics Attended	23
E.	Emergency Cases Observed	24
F.	Paediatrics Procedures Observed	26
G.	Common Drugs Used In Paediatrics	27
H.	Instruments Used In Paediatrics	29
I.	Nutrition Related To Paediatrics	30
4.	Annexure-1: Course Content- Phase II	31
5	Annexure-2 : Course Content- Phase III-I	32
6	Annexure-3 : Course Content- Phase III-II	33
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8	Annexure-5 : Distribution Of Journal Marks	35
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10	Paediatrics in General	37
11	List of abbreviations	41

GENERAL INSTRUCTIONS

1. This Journal is a record of the academic activities of the designated student, who would be responsible for maintaining his/her Journal.

2. The student is responsible for getting the entries in the Journal verified by the Faculty in charge regularly.

3. Entries in the Journal will reflect the activities undertaken in the department and have to be scrutinized by the Head of the concerned department.

4. The Journal is a record of various activities by the student like:

   - Overall participation and performance
   - Attendance
   - Participation in sessions
   - Record of completion of pre-determined activities.
   - Acquisition of selected competencies.

5. The Journal is the record of work done by the candidate in that department / specialty and should be verified by the college before submitting the application of the students for the Universityexamination.

6. Proposednumberofcaserecordsshouldbementionedinthejournal-:

   Phase: II- first clinical posting (Two weeks)-
   Phase: III-I-second clinical posting in Third Minor (Fourweeks)-
   Phase: III-II Third Clinical postingin Third Major (Four weeks)-

INDEX

1. Long Cases:

Sr. No.	Date	Name of Patient	Diagnosis	Page No.	Sign of Teacher
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					

2. Short Cases:

Sr. No.	Date	Name of Patient	Diagnosis	Page No.	Sign of Teacher
1					
2					
3					
4					
5					
6					

3. New Born Cases:

Sr. No.	Date	Name of Patient / New Born	Diagnosis	Page No.	Sign of Teacher
1					
2					
3					
4					
5					
6					

4. Immunization O.P.D. attended:

Sr. No.	Date	Immunization Attended	Sign of Teacher
1			
2			
3			
4			
5			

5. Procedures observed:

Sr. No.	Date	Name of Procedure Observed	Sign of Teacher
1			
2			
3			
4			
5			

6. Emergencies attended:

Sr. No.	Date	Name of Patient	Diagnosis	Sign of Teacher
1				
2				
3				
4				
5				

7. Drug information:

Sr. No.	Date	Name of Drugs	Sign of Teacher
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

8. **Nutrition-**

Sr. No.	Date	Name of food item	Sign of Teacher
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

9. **X-Ray**

Sr. No.	Date	Diagnosis of X-Ray	Sign of Teacher
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

10. **Instruments-**

Sr. No.	Date	Name of Drugs	Sign of Teacher
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

Template for Clinical Cases of Paediatrics

A. LONG CASE-

Informant-

Reliability – Good/Bad, consistent/ non consistent

OPD/IPD no.-

Name of the child-

Birth date- / /

Age -

Gender - M/F

Religion and caste.

Address-

Date of admission- / /

Date of examination- / /

- **Chief Complaints** – (in chronological order)
  1)
  2)
- **History of Present Illness –**
- **Past History –**
- **Personal History** -

  Bladder- Bowel-

  Sleep- Appetite-

  Addictions- Habits-

  Menstrual cycle-

  Relation with friends- Sports participation-

- **Family history- Pedigree chart:**
- **Birth History-**

➢ Antenatal history -

- Age of mother at marriage-
- Age of mother at pregnancy-
- Registration of pregnancy.
- Medication taken like iron, folic acid and calcium-
- Drug intake during pregnancy -
- Immunization of mother –
- History of trauma.
- Any illness or infection-
- Radiation exposure-
- Hospitals stay during pregnancy.
- History of smoking, drinking alcohol, any other-

➢ Natal history –

- Gestational age-
- Duration of Labor-

- Place of delivery- Home/ Hospital
- Person conducting the delivery-
- Mode of delivery-
- Babies cry immediately after birth-
- Birth weight of the baby-
- Date and time of birth-
- Any congenital malformation noted

➢ Post-natal history

➢ Neonatal history -

- Time of first breast feeding-
- Top feeds given-
- Any feeding difficulty-
- Prelacteal feeds given-
- NICU stay-
- Time of passage of first meconium- urine-
- History of neonatal convulsions or jaundice-

- **Developmental history-**

1) Motor milestones-
   - ✓ Grossmotormilestones
   - ✓ Finemotormilestones

2)Adoptivemilestones-

3)Socialmilestones

4)Languagemilestones-

- **Immunization History –**

BCG- given/ not, Scar- present/absent	OPV 0, 1,2, 3, booster
DPT- 1,2 3, booster	Measles
Vitamin-A	MMR-
Other vaccines-	

- **Dietary History-**

Protein intake– Actual----------Expected----------

Calorie intake- Actual----------Expected----------

- **Socioeconomic History -**

Total no. of members in the family-

Floor space area-

Per capita income-

Education of the Father ---------- Mother----------

Occupation of the Father ---------- Mother----------

Housing type- kaccha/pakka

Ventilation- Water supply-

Sanitation – toilet facilities / open air defecation.

Socio economic status.-

General Examination:

- **Anthropometry:**

No.	**Parameter**	**Actual**	**Expected**
1	Weight		
2	Height / Length:		
3	Head circumference:		
4	Chest circumference:		
5	Mid arm circumference:		
6	Upper segment: lower segment ratio:		
7	Body mass index:		
8	Arm span:		
9	Midpoint of stature:		

- **Vital Parameters: -**

1. Temperature: ----------F/ ----------C

2. Pulse –

- Rate- beats/min. Rhythm-Regular /Irregular
- Character- Volume-
- Radio femoral Delay- Capillary refill-

3. Respiration- Rate---- - cycles/min

4. Blood pressure -

- Right upper limb- / mmHg Left upper limb- / mmHg
- Right upper limb- / mmHg Left upper limb- / mmHg

5. Jugular venous pressure-

Head to Toe Examination-

a. Head-

- Size- normal/ microcephaly/macrocephaly
- Shape-
- Cephalic index-
- Craniosynostosis-
- Bossing / prominence-
- Fontanel- anterior- open (size-)/closed
- Post. Fontanels- (size-)/closed
- Scalp swelling -
- Transillumination of skull

b. Hair-

Colour- Texture Pigmentation-
Luster - Hair line –Low/normal/high

c. Face-

d. Eyes-

- Eyelids- Intercanthal distance-
- Eyebrows- Eyelashes-
- Conjunctiva- Cornea –
- Lens- Sclera-
- Fundus Conjunctiva -

e. Ear-

- Setting of ears –Low/normal Ear tag –
- Large prominent ear- Pinna –
- External auditory canal- Tympanic membrane

f. Mouth-

- Oral cavity- Buccal mucosa-
- Dentition: Gums:
- Tongue : Examination of throat-
- Lips : Cyanosis- Philthrum- other-
- Tonsil- Uvula-
- Posterior pharyngeal wall-

g. Neck-

- Swelling of neck : Webbing of neck
- Enlarged distended neck veins- Short neck
- cervical group of lymph nodes- Thyroid gland-
- Position of trachea - Neck stiffness

h. Skin-

- Colour- Turgor- Infections - Rash
- Subcutaneous nodules- Xanthoma and xanthelasma- Stria-

i. Hand-

- Congenital malformation -
- Single Palmar crease -
- Finger – Clubbing- Nails-

j. External gentile –

- Tanner staging sexual maturity score-
- Penile length:

k. Bones, Joints, Spine and Back-

l. Any Obvious Congenital Anomalies:

Systemic Examination:
Provisional Diagnosis-

1)
2)
3)
4)

Investigations-

Final Diagnosis-

Treatment-

Case Summary-

Date- **Signature of Teacher**

B. SHORT CASE

- Informant-
- Reliability –
- Consistent/ non consistent
- OPD/IPD no.-
- Name of the child-
- Birth date- / / Age -
- Gender - M/F Religion and caste.
- Address –
- Date of admission- / / Date of examination- / /

Chief Complaints – (in chronological order)

1)
2)
3)

General Examination:

- **Anthropometry:**

No.	Parameter	Actual	Expected
1	Weight		
2	Height / Length:		
3	Head circumference:		
4	Chest circumference:		
5	Mid arm circumference:		
6	Upper segment: lower segment ratio:		
7	Body mass index-		
8	Arm span-		
9	Midpoint of stature-		

- **Vital Parameters: -**

1. Temperature: ----------F/ ----------C

2. Pulse –

- Rate- beats/min. Rhythm-Regular /Irregular
- Character- Volume-
- Radiofemoral Delay- Capillary refill-

3. Respiration- Rate---- - cycles/min

4. Blood pressure -

- Right upper limb- / mmHg Left upper limb- / mmHg
- Right upper limb- / mmHg Left upper limb- / mmHg

5. Jugular Venous Pressure-

Head to Toe Examination-

a) **Head-**
   - Size- normal/ microcephaly/macrocephaly Shape-
   - Cephalic index-
   - Craniosynostosis- Bossing / prominence-
   - Fontanel- anterior- open (size-)/closed
   - Post. Frontanelle- (size-)/closed
   - Scalp swelling -
   - Transillumination of skull

b) **Hair-**
   Colour- Texture Pigmentation-
   Luster - Hair line –Low/normal/high

c) **Face-**

d) **Eyes-**
   - Eyelids- Intercanthal distance-
   - Eyebrows- Eyelashes-
   - Conjunctiva- Cornea –
   - Lens- Sclera-
   - Fundus Conjuctiva -

e) **Ear-**
   - Setting of ears –Low/normal Ear tag –
   - Large prominent ear- Pinna –
   - External auditory canal- Tymphanic membrane

f) **Mouth-**
   - Oral cavity- Buccal mucosa-
   - Dentition: Gums:
   - Tongue : Examination of throat-
   - Lips : Cyanosis- Philthrum- other-
   - Tonsil- Uvula-
   - Posterior pharyngeal wall-

g) **Neck-**
   - Swelling of neck : Webbing of neck
   - Enlarged distended neck veins- Short neck
   - cervical group of lymph nodes- Thyroid gland-
   - Position of trachea - Neck stiffness

h) **Skin-**
   - Colour- Turgor- Infections - Rash
   - Subcutaneous nodules- Xanthoma and xanthelasma- Stria-

i) **Hand-**
   - Congenital malformation -
   - Single Palmar crease -

- Finger –Clubbing- Nails

j. External Gentile –
Tanner staging sexual maturity score-
Penile length:

k. Bones, Joints, Spine and Back-

l. Any Obvious Congenital Anomalies:

Systemic Examination-

Provisional Diagnosis-
1)
2)
3)
4)
5)

Investigations-

Final Diagnosis-

Treatment-

Case Summary-

Date- **Signature of Teacher**

C. NEONATAL CASE

OPD/IPD NO. - Date-
Name of mother-
Name of father-
Date of delivery-
Sex of baby- m/f caste /religion-
Place of delivery- date of examination-

Maternal History-
Antenatal history -

- Age at marriage- Age at pregnancy-
- Registration of pregnancy- P- , G- , L- ,A-
- Family history-
- Consanguity- yes/no grade-
- Medication taken like iron, folic acid and calcium supplements-
- Drug intake during pregnancy –
- Immunization status of mother –
- Any illness or infection during pregnancy –
- Radiation exposure- Hospitals stay during pregnancy-
- History of smoking, drinking alcohol, any other.-
- History of trauma-

Natal history –

- Apgar score-
- Gestational age- Duration of Labor-
- Place of delivery- Home/ Hospital
- Person conducting the delivery-Mode of delivery-
- Babies cried immediately after birth-
- Birth weight of the baby-
- Date and time of birth-
- Any congenital malformation noted-

Postnatal history –
Neonatal history -

- Time of first breast feeding-
- Top feeds given-
- Any feeding difficulty-
- Prelacteal feeds given-
- NICU stay-
- Time of passage of first meconium- first urine-
- History of convulsions or jaundice-
- Inj. Vit. K given/not-
- Anyotherproblems-

Feeding History -

Immunization History –

- BCG- OPV '0' dose Any Other vaccines-

General Examination:

- **Anthropometry:**

No.	Parameter	Actual	Expected
1	Weight		
2	Length		
3	Head circumference:		
4	Chest circumference:		

- **Vital Parameters: -**

1. Temperature: ----------F/ ----------C

2. Pulse –

- Rate- beats/min.
- Rhythm-Regular /Irregular
- Character-
- Volume-
- Radio-femoral Delay-
- Capillary refill-

3. Respiration-Rate---- - cycles/min

4. Blood Pressure -

- Right upper limb- / mmHg
- Left upper limb- / mmHg
- Right upper limb- / mmHg
- Left upper limb- / mmHg

5.Pulse Oximetry- (Pre and Post Ductal Saturation)

- **Head to Toe Examination-**

a) Head-

- Size- normal/ microcephaly/macrocephaly Shape-
- Cephalic index-
- Craniosynostosis- Bossing / prominence-
- Fontanel- anterior- open (size-)/closed
- Post. Frontanelle- (size-)/closed
- Scalp swelling - Transillumination of skull

b) Hair-

Colour- Texture Pigmentation-

Luster - Hair line –Low/normal/high

c) Face-

d) Eyes-

- Eyelids- Intercanthal distance-
- Eyebrows- Eyelashes-

- Conjunctiva- Cornea –
- Lens- Sclera-
- Fundus Conjuctiva -

e) Ear-

- Setting of ears –Low/normal Ear tag –
- Large prominent ear- Pinna –
- External auditory canal- Tymphanic membrane

f) Mouth-

- Oral cavity- Buccal mucosa-
- Dentition: Gums:
- Tongue : Examination of throat-
- Lips : Cyanosis- Philthrum- other-
- Tonsil- Uvula-
- Posterior pharyngeal wall-

g) Neck-

- Swelling of neck : Webbing of neck
- Enlarged distended neck veins- Short neck
- cervical group of lymph nodes- Thyroid gland-
- Position of trachea - Neck stiffness

h) Skin-

- Colour- Turgor- Infections - Rash
- Subcutaneous nodules- Xanthoma and xanthelasma- Stria-

i) Hand-

- Congenital malformation -
- Single Palmar crease -
- Finger – Clubbing- Nails-

j. **External Gentile –**
Tanner staging sexual maturity score-
Penile length:

k. **Bones, Joints, Spine And Back**

l. **Any Obvious Congenital Anomalies:**

Neonatal Reflexes-

1) Rooting reflex:
2) Suckling reflex:
3) Doll's eye response:
4) Light reflex:
5) Glabellar tap:
6) McCarthy's reflex:
7) Gallant's reflex:
8) Perez reflex:
9) Landau's reflex:
10) Moro's reflex-
11) Stepping reflex
12) Placing reflex-
13) Prone crawl reflex :

14) Plantar & palmar grasp:
15) Crossed adductor reflex: :
16) Magnet reflex:
17) Asymmetric tonic neck reflex:-
18) Symmetric tonic neck reflex:-
19) Pull-to-sit-
20) Babinski or plantar reflex :-
21) Righting reflexes-

Systemic Examination—

Provisional Diagnosis-
1)
2)
Investigations-
Final Diagnosis-
Treatment-

Case Summary-

DateSignature of Teacher

D. IMMUNIZATION O.P.D. ATTENDED

Date-

Paste picture of vaccine

Name of vaccine –

Dose-

Route-

Special precautions-

Indications-

Contraindications-

Side effects-

Storage-

Any other Details of vaccine-

Sign of vaccinator-

E. EMERGENCY CASES OBSERVED-

Common Paediatrics Emergencies-

1. Basic Paediatrics and Neonatal Life Support and Advanced Cardiac Life Support.
2. Organophosphorous Poisoning
3. Kerosene Poisoning
4. Iron Poisoning
5. Dhatura Poisoning
6. Snake Bite
7. Scorpion Bite
8. Anaphylactic Shock
9. Hematemesis
10. Shock
11. Severe Dehydration
12. Acute Respiratory Failure
13. Acute Renal Failure
14. Status Asthamaticus
15. Severe Hypokalemia
16. Status Epilepticus
17. Hepatic Encephalopathy
18. Diabetic Ketoacidosis
19. Coma
20. Hypoglycemia

Template-

- OPD/IPD no.-
- Name of the child-
- Birth date- / / Age -
- Gender - M/F
- Date of admission- / /
- Date of examination- / /

Chief Complaints – (in chronological order)

1)
2)
3)
4)

History of Present Illness –

Vital Parameters: -

1. Temperature: ----------F/ ----------C

2. Pulse –

- Rate- beats/min. Rhythm-Regular /Irregular
- Character- Volume-
- Radio femoral Delay- Capillary refill-

3. Respiration-Rate---- - cycles/min

4. Blood Pressure -

- Right upper limb- / mmHg Left upper limb- / mmHg
- Right upper limb- / mmHg Left upper limb- / mmHg

5. Jugular Venous Pressure-

Head to Toe Examination- Any positive findings

Systemic Examination- positive findings only

Details of emergency attended

Final Diagnosis-

Treatment-

Case Summary-

Date- **Signature of Teacher**

F. PAEDIATRIC PROCEDURES OBSERVED

Requires certification-

- Anthropometry
- Development assessment
- Breast feeding, observation and counseling
- BMI calculation
- Prescription of Immunizations schedule
- Naso-gastric tube passage in manikin
- IV line in manikin
- Interosseous insertion in manikin
- Airway management
- Oxygen administration
- Bag ventilation
- Monitoring of shock
- IV access
- Calculation of fluid requirements
- Monitoring of unconscious
- Dehydration assessment
- BLS in manikin
- Urine dipstick
- Identification of BCG scar
- Interpret Mantoux

Following procedures to be only observed-

- Lumbar Puncture
- Liver biopsy
- Renal biopsy
- Bone marrow
- Bladder Catheterization
- Peripheral IV Insertion
- Insertion of Umbilical Venous and Arterial Lines
- Insertion of Naso -Gastric Feeding Tubes/Ryles tube
- Neonatal Intubation
- Neonatal Resuscitation
- Pediatric Resuscitation
- Intramuscular, intra-dermal, subcutaneous injections
- Bag and mask use

Template-

Name of Procedure

- OPD/IPD no.-
- Name of the child-

- AGE- SEX-
- Address –
- Date of admission- / /
- Date of procedure- / /

Chief Complaints – (in chronological order)

1)
2)
3)
4)

History of Present Illness –

Prerequisites-

Preparation-

Procedure details-
Post Procedure Care-

Complications Known-

Any Other-

Date- **Signature of Teacher**

G. COMMON DRUGS USED IN PAEDIATRICS

- **Name of drug-**
- **Class/ Group of Drug-**
- **Doses-**
- **Mechanism of action-**
- **Uses-**
- **Side effects-**
- **Contraindications-**
- **Any other-**

Paste picture of drug here

Date- **Signature of Teacher**

H. INSTRUMENTS USED IN PAEDIATRICS

Name of instrument-

Photograph of Instrument

Uses-

Precautions-

Describe procedure where it is used-

Any other –

Sign of Teacher

I. NUTRITION RELATED TO PAEDIATRICS

Name of food item-

Class-

Photograph

Nutritive contents –

Nutritive values-

Medicinal use-

Contraindications

Any other details-

Sign of Teacher-

Annexure- 1.--

Course Content Phase II(October 2020)

Subject: PAEDIATRICS

Theory / Practical

(Based on National Medical Council of India, Competency based Undergraduate curriculum for the Indian Medical Graduate, 2018. Vol. 2 / 3.)

1. Total Teaching hours:
   A. Lectures(hours): **No**
   B. Self-directed learning (hours):
   C. Clinical Postings(hours):
      - Weeks- 2 wks
      - Hours per week-15
      - Monday to Friday- 3 hours per day.
   D. Small group teachings/tutorials/Integrated teaching/Practical(hours)**:**No

Tentative Clinical posting schedule-

Day	Topic	Day	Topic
1	Round to Paediatric ward, Maternal ward, Kangaroo Mother Care, PICU, NICU, Labour room, OPD, Immunisation room etc.	6	Systemic examination of child- CVS
2	History taking in Paediatrics	7	Systemic examination of child- RS and PA
3	Assessment of growth and development	8	Neonatal examination
4	General examination of child.	9	Elicitation of neonatal reflexes
5	Systemic examination of child- CNS	10	Posting ending exam

Competency Nos.	Topics, Subtopics and Lectures

Annexure- 2.

Course Content Phase III-I(October 2020)

Subject: PAEDIATRICS (Theory / Practical)

(Based on National Medical Council of India, Competency based Undergraduate curriculum for the Indian Medical Graduate, 2018. Vol. 2 / 3.)

Total Teaching hours:

A. Lectures (hours): 20
B. Self-directed learning (hours): 5
C. Clinical Postings (hours):
- Weeks- 4
- Hours per week- 15
- Monday to Friday- 3 hours per day.

D. Small group teachings/tutorials/Integrated teaching/Practical (hours)**: 30**

Tentative Clinical posting schedule-

Day	Topic	Day	Topic
1	Round to Paediatric ward, Maternal ward, Kangaroo Mother Care, PICU, NICU, Labour room, OPD, Immunisation room etc.	11	Elicitation of neonatal reflexes
2	History taking in Paediatrics	12	Immunisation clinic
3	Assessment of growth and development	13	Immunisation clinic
4	General examination of child.	14	Immunisation clinic
5	Systemic examination of child- CNS	15	Immunisation clinic
6	Systemic examination of child- CNS	16	Paediatric Emergencies
7	Systemic examination of child- RS	17	Paediatric Emergencies
8	Systemic examination of child- Per Abdomen	18	Paediatric Emergencies
9	Systemic examination of child- CVS	19	Paediatric Emergencies
10	Neonatal case taking and examination.	20	Posting ending exam

Competency Nos.	**Topics, Subtopics and Lectures**

Annexure- 3.

Course Content Phase: III-II(October 2020)

Subject: PAEDIATRICS (Theory / Practical)

(Based on National Medical Council of India, Competency based Undergraduate curriculum for the Indian Medical Graduate, 2018. Vol. 2 / 3.)

Total Teaching hours:

A. Lectures (hours): 20
B. Self-directed learning (hours): 10
C. Clinical Postings (hours):
- Weeks- 4
- Hours per week- 15
- Monday to Friday- 3 hours per day.

D. Seminars/Small group teachings/tutorials/Integrated teaching/Practical (hours)**:** 35

Tentative Clinical posting schedule-

Day	Topic	Day	Topic
1	History taking and General examination of child.	11	Neonatal case taking, examination and Elicitation of neonatal reflexes
2	Systemic examination of child- CNS	12	Demonstration of Common procedures related to Paediatrics
3	Systemic examination of child- CNS	13	Demonstration of Common procedures related to Paediatrics
4	Systemic examination of child- RS	14	Common Drugs used in Paediatrics
5	Systemic examination of child- Per Abdomen	15	Common Drugs used in Paediatrics
6	Systemic examination of child- CVS	16	Common Instruments used in Paediatrics
7	Systemic examination of child- CVS	17	X-Ray film reading related to Paediatrics.
8	Short case discussion	18	Nutrition
9	Neonatal case taking, examination and Elicitation of neonatal reflexes	19	Nutrition
10	Neonatal case taking, examination and Elicitation of neonatal reflexes	20	Posting ending exam

Competency Nos.	**Topics, Subtopics and Lectures**

Annexure- 4.

Exam Pattern – Paediatrics

Theory Paper (100 marks)

- Section A- MCQ-:
- Section B-
- Section C-

Practical exam (100 marks)

- Long case-
- Short case/ New born-
- Table viva- (Drugs, Instruments, Nutrition, Vaccines and X-Rays-
- OSCE-

Internal Assessment:

- 50% combined in theory and practical (not less than 40% in each) for eligibility for appearing for University

University Examination

- Mandatory 50% marks separately in theory and practical (practical = practical/ clinical + viva)

Annexure- 5
Distribution of journal marks
Total- 10 marks

Parameter	Total	Marks	Phase
Long cases	-	-	Phase: II (Second year)
	6 (CNS-2, RS-1, PA-1, CVS-2)	1	Phase: III-1 (Third Minor)
	66 (CNS-2, RS-1, PA-1, CVS-2)	1	Phase: III-II (Third Major)
Short cases	3	1/2	Phase: II (Second year)
	3	1/2	Phase: III-1 (Third Minor)
	3	1/2	Phase: III-II (Third Major)
Newborns	3	1/2	Phase: II (Second year)
	3	1/2	Phase: III-1 (Third Minor)
	3	1/2	Phase: III-II (Third Major)
Emergencies	5	1	Phase: III-1 (Third Minor)
Procedures	5	1	Phase: III-II (Third Major)
Vaccines	All vaccines as per Government of India.	1	Phase: III-I
Drugs	10	1	Phase: III-II
Instruments	10	1/2	Phase: III-II
Nutrition	10	1/2	Phase: III-II
Total- 10 marks			

Recommended books

Sr.no.	Author	Title of book/ Material	Publisher
1.	Vinod Paul, Arvind Bagga	Ghai Essential Pediatrics	CBS Publishers
2.	Meherban Singh	Pediatric Clinical Methods	CBS Publishers
3.	Michael Glynn William M Drake	Hutchison's Clinical Methods	Elsevier
4.	A Parthasarathy	IAP Colour Atlas of Pediatrics	Jaypee
5.	Tom Lissauer Will Carroll	Illustrated Textbook of Pediatrics	Elsevier
6.	Meherban Singh	Care of newborn	CBS Publishers

PEDIATRICS (CODE: PE) IN GENERAL

Competencies: The student must demonstrate:

1. Ability to assess and promote optimal growth, development and nutrition of children and adolescents andidentify deviations from normal,
2. Ability to recognize and provide emergency and routine ambulatory and First Level Referral Unit care forneonates, infants, children and adolescents and refer as may be appropriate,
3. Ability to perform procedures as indicated for children of all ages in the primary care setting,
4. Ability to recognize children with special needs and refer appropriately,
5. Ability to promote health and prevent diseases in children,
6. Ability to participate in National Programmes related to child health and in conformation with the IntegratedManagement of Neonatal and Childhood Illnesses (IMNCI) Strategy,
7. Ability to communicate appropriately and effectively.

Integration: The teaching should be aligned and integrated horizontally and vertically in order to provide comprehensive care for neonates, infants, children and adolescents based on a sound knowledge of growth, development, disease and their clinical, social, emotional, psychological correlates in the context of national health priorities.

Table 1: Time distribution of MBBS Programme & Examination Schedule

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
							Foundation Course	I MBBS			
I MBBS								Exam I MBBS	II MBBS		
II MBBS								Exam II MBBS	III MBBS		
III MBBS Part I									Exam III MBBS Part I	Electives & Skills	
III MBBS Part II											
Exam III MBBS Part II		Internship									
Internship											

- One month is provided at the end of every professional year for completion of examination and declaration of results.

Table 2: Distribution of subjects by Professional Phase

Phase & year of MBBS training	Subjects & New Teaching Elements	Duration#	University examination
First Professional MBBS	• Foundation Course (1 month) • Human Anatomy, Physiology & Biochemistry, introduction to Community Medicine, Humanities • Early Clinical Exposure	1 + 13 months	I Professional
	• Attitude, Ethics, and Communication Module (AETCOM)		
Second Professional MBBS	• Pathology, Microbiology, Pharmacology, Forensic Medicine and Toxicology, • Introduction to clinical subjects including Community Medicine • Clinical postings • Attitude, Ethics & Communication Module (AETCOM)	12 months	II Professional
Third Professional MBBS Part I	• General Medicine, General Surgery, Obstetrics & Gynecology, Pediatrics, Orthopedics, Dermatology, Psychiatry, Otorhinolaryngology, Ophthalmology, Community Medicine, Forensic Medicine and Toxicology, Respiratory medicine, Radiodiagnosis & Radiotherapy, Anesthesiology • Clinical subjects /postings • Attitude, Ethics & Communication Module (AETCOM)	13 months	III Professional (Part I)
Electives	• Electives, Skills and assessment*	2 months	
Third Professional MBBS Part II	• General Medicine, Pediatrics, General Surgery, Orthopedics, Obstetrics and Gynecology including Family welfare and allied specialties • Clinical postings/subjects • Attitude, Ethics & Communication Module (AETCOM)	13 months	III Professional (Part II)

*Assessment of electives shall be included in Internal Assessment.

Table 6: Third Professional Part I teaching hours

Subjects	Teaching Hours	Tutorials/ Seminars /Integrated Teaching (hours)	Self- Directed Learning (hours)	Total (hours)
General Medicine	25	35	5	65
General Surgery	25	35	5	65
Obstetrics and Gynecology	25	35	5	65
Pediatrics	20	30	5	55
Orthopaedics	15	20	5	40
Forensic Medicine and Toxicology	25	45	5	75
Community Medicine	40	60	5	105
Dermatology	20	5	5	30
Psychiatry	25	10	5	40
Respiratory Medicine	10	8	2	20
Otorhinolaryngology	25	40	5	70
Ophthalmology	30	60	10	100
Radiodiagnosis and Radiotherapy	10	8	2	20
Anesthesiology	8	10	2	20
Clinical Postings*	-	-	-	756
Attitude, Ethics & Communication Module (AETCOM)		19	06	25
Total	303	401	66	1551

** The clinical postings in the third professional part I shall be 18 hours per week (3 hrs per day from Monday to Saturday).*

Table 7: Third Professional Part II teaching hours

Subjects	Teaching Hours	Tutorials/Seminars / Integrated Teaching (hours)	Self - Directed Learning (hours)	Total* (hours)
General Medicine	70	125	15	210
General Surgery	70	125	15	210
Obstetrics and Gynecology	70	125	15	210
Pediatrics	20	35	10	65
Orthopaedics	20	25	5	50
Clinical Postings**				792
Attitude, Ethics & Communication Module (AETCOM)***	28		16	43
Electives				200
Total	250	435	60	1780

* 25% of allotted time of third professional shall be utilized for integrated learning with pre- and para- clinical subjects and shall be assessed during the clinical subjects examination. This allotted time will be utilized as integrated teaching by para-clinical subjects with clinical subjects (as Clinical Pathology, Clinical Pharmacology and Clinical Microbiology).

Table 8: Clinical postings

Subjects	Period of training in weeks			Total weeks
	II MBBS	III MBBS Part I	III MBBS Part II	
Electives	-	-	8* (4 regular clinical posting)	4
General Medicine[1]	4	4	8+4	20
General Surgery	4	4	8+4	20
Obstetrics &Gynaecology[2]	4	4	8 +4	20
Pediatrics	2	4	4	10
Community Medicine	4	6	-	10
Orthopedics - including Trauma[3]	2	4	2	8
Otorhinolaryngology	4	4	-	8
Ophthalmology	4	4	-	8
Respiratory Medicine	2	-	-	2
Psychiatry	2	2	-	4
Radiodiagnosis[4]	2	-	-	2
Dermatology, Venereology & Leprosy	2	2	2	6
Dentistry & Anesthesia	-	2	-	2
Casualty	-	2	-	2
	36	42	48	126

* In four of the eight weeks of electives, regular clinical postings shall be accommodated.

Clinical postings may be adjusted within the time framework.

[1] This posting includes Laboratory Medicine (Para-clinical) & Infectious Diseases (Phase III Part I).

[2] This includes maternity training and family welfare (including Family Planning).

[3] This posting includes Physical Medicine and Rehabilitation.

[4] This posting includes Radiotherapy, wherever available.

List of abbreviations

A	Attitude
AETCOM	Attitude Ethics and Communication
Anat	Anatomy
Biochem	Biochemistry
Cardio	Cardiology
Com Med	Community Medicine
Derm	Dermatology
DOAP	Demonstrate Observe Assist Perform
ENT	ENT
Forensic	Forensic Medicine
Gastro	Gastroenterology
K	Knows
KH	Know How
S	Shows
C	Communication
Med	Gen Medicine
Micro	Microbiology
N	No
OBG	Obstetrics & Gynecology
Ophthal	Ophthalmology
OSCE	Objective Structured Clinical Examination
OSPE	Objective Structured Practical Examination
Psych	Psychiatry
PMR	Physical Medicine Rehabilitation
Path	Pathology
Physio	Physiology
Pharm	Pharmacology
SAQ	Short Answer Question
SGD	Small Group Discussion
Surg	Gen Surgery
RadioD	Radio diagnosis
Resp Med	Respiratory Medicine
Y	Yes

- Pages for all the phases will be added and color coded as follows-
  Phase II : yellow
  Phase III-I: Green
  Phase III-II: Brown.

PAEDIATRIC LOGBOOK for MBBS STUDENTS AS PER COMPETENCY BASED CURRICULUM

PHASE II to PHASE III/II MBBS

Preface

The Medical Council of India has revised the undergraduate medical education curriculum so that the Indian Medical Graduate (IMG) is able to recognize **"Health for all"** as a national goal. He/she should also be able to fulfil his/her societal obligations. The revised curriculum has specified the competencies that a student must attain and clearly defined teaching learning strategies for the same. With this goal in mind, integrated teaching, skill development, AETCOM and self-directed learning have been introduced. There would be emphasis on communication skills, basic clinical skills and professionalism. There is a paradigm shift from the traditional didactic classroom-based teaching to learning environments where there is emphasis on learning by exploring, questioning, applying, discussing, analysing, reflecting, collaborating and doing. The recognition of this need is enshrined by a greatly enhanced allocation of time to these methods and also the assessment techniques. With this view in mind the log book has been designed as per the guidelines of competency Based curriculum.

Name of the College

_____

_____

Admission Year: _____

CERTIFICATE

This is to certify that,

Mr/Ms._____

Roll No. _____ has satisfactorily attended/completed all assignments mentioned in this logbook as per the guidelines prescribed by Medical Council of India, for MBBS Competency Based Curriculum in the subject of PAEDIATRICS

Date: ___/___/_____

Place: _____

Teacher In charge **Professor and Head**

Department of PAEDIATRICS

Instructions

1) This logbook is prepared as per the guidelines of MCI for implementation of Competency based curriculum for MBBS students in the subject of Paediatrics.

2) Students are instructed to keep their logbook entries up to date.

3) Students are expected to write minimum 2 reflections on any two activities each of Clinical Paediatrics skills & Self-Directed Learning (SDL).

4) Students also have to write reflections on AETCOM Module. Reflections should be structured using the following guiding questions:

- What happened? (What did you learn from this experience)
- So what? (What are the applications of this learning)
- What next? (What knowledge or skills do you need to develop so that you can handle this type of situation?)

5) The logbook assessment will be based on multiple factors like

- Attendance
- Active participation in the sessions
- Timely completions
- Quality of write up of reflections
- Overall presentation

INDEX

Sr. No	Description	Page No's	REMARK	Signature of Teacher
1	Clinical Paediatrics Skills			
2	Self-Directed Learning, Seminars, Projects, Quizzes			
3	AETCOM Module			
4	Attendance Records			
5	Records of Internal Assessment			

* AETCOM – Competencies for IMG, 2018, Medical Council of India.

Record of Clinical PediatricsSkills

Clinical skills can be assessed by case presentation, case based discussion, objective structured clinical assessment the checklist, MiniCex, as per the institutional preference.

I) SECOND PHASE MBBS

Competency # addressed	**Name of activity**	**Site WARD, skill lab, OPD , Casualty ,**	**Date completed**	Attempt at activity First (F) Repeat (R)	Sign of faculty	Sign of Learner	**Method of assessment**	**SCORE**

II) THIRD PHASE MBBS PART I

Competency # addressed	**Name of activity**	**Site WARD, skill lab, opd casualty,**	**Date completed**	Attempt at activity First (F) Repeat (R)	Sign of faculty	Sign of Learner	**Method of assessment**	**SCORE**

II) THIRD PHASE MBBS PART II

Competency # addressed	**Name of activity**	**Site WARD, skill lab, OPD , casualty ,**	**Date completed**	Attempt at activity First (F) Repeat (R)	Sign of faculty	Sign of Learner	**Method of assessment**	**SCORE**

Reflection on Clinical Paediatrics Skills

Topic: **Date:**

Signature of Teacher-in- charge

Reflection on Clinical Paediatrics Skills

Topic: **Date:**

Signature of Teacher-in- charge

Reflection on Clinical PAEDIATRICS Skills

Topic: **Date:**

Signature of Teacher-in- charge

2. Self Directed Learning, Seminars, Tutorials, Projects, Quizzes

S.No	PHASE	Self Directed Learning, Seminars, Tutorials, Projects, Quizzes	Date	Signature of Teacher

Reflection on self directed learning activities

Topic: **Date:**

Signature of Teacher-in- charge

Reflection on self directed learning activities

Topic: **Date:**

Signature of Teacher-in- charge

Reflection on self directed learning activities

Topic: **Date:**

Signature of Teacher-in- charge

3: AETCOM Module

Counselling for Investigation, Treatment, Prognosis, Blood donation, Breaking Bad news. All types of consent. Medicolegal aspects and Ethics, Empathy and professionalism as per the Phase of the MBBS. Include cases of Allied branches also.

Competency to be assessed during Clinical postings and /or small group discussions.

AetCom skills can be assessed by use of Kalamazoo consensus.

Criteria	Phase II Score	Phase III/I Score	Phase III/II Score	
Builds relationship				
Opens the discussion				
Gathers information				
Understands the parent's perspective				
Shares information				
Manages flow				
Overall rating				
Signature of teacher				

Communication skills rating scale adapted from Kalamazoo consensus statement

Rating 1-3 - Poor, 4 -6 Satisfactory, 6 -10 Superior

PHASE II- AETCOM (Two assessments)

Competency # addressed	**Name of competency**	**Site WARD, skill lab, opd , casualty,**	**Date completed**	Attempt at activity First (F) Repeat (R)	Sign of faculty	Sign of Learner	**Method of assessment**	**SCORE**

PHASE III PART 1 (TWO ASSESSMENTS)

Competency # addressed	Name of Competency	Site WARD, skill lab, opd , casualty,	Date completed	Attempt at activity First (F) Repeat (R)	Sign of faculty	Sign of Learner	Method of assessment	SCORE

PHASE III PART 2 (TWO ASSESSMENTS)

Competency # addressed	**Name of Competency**	**Site** **WARD, skill lab, opd , casualty,**	**Date completed**	Attempt at activity First (F) Repeat (R)	Sign of faculty	Sign of Learner	**Method of assessment**	**Score**

Reflection on AETCOM module

Topic: **Date:**

Signature of Teacher-in- charge

Reflection on AETCOM module

Topic: **Date:**

Signature of Teacher-in- charge

Reflection on AETCOM module

Topic: **Date:**

Signature of Teacher-in- charge

4A: Attendance Record of the Student

S. No	Term	Theory (%)	Practical (%)	Signature of the Student	Signature of the Teacher
A	II PHASE				
B	III PHASE PART 1				
C	III PHASE PART 2				
E	OVER ALL ATTENDANCE				

Note: Above information is for the benefit of students and parents. In case of any discrepancy departmental record will be treated as final.

SECTION 4B: Details of attending extra classes [For poor attendance (if any)]

S.No	Date	Period	Total hrs	Signature of student	Signature of Teacher
Total hours					

Note: Above information is for the benefit of students and parents. In case of any discrepancy departmental record will be treated as final.

Section 5. Records of Internal Assessment Examinations

Records of Internal Assessment examinations

S.No	Exam	Theory	Practical including log book	Signature of student	Signature of Teacher
1	I Internal Assessment	/50	/ 50		
2	II Internal Assessment	/ 50	/ 50		
3	III Internal Assessment	/ 50	/ 50		
4	IV Internal Assessment (Prelim)	/100	/100		
4	Internal Assessment marks	/ 250	/ 250		
5	Converted marks	/25	/25		
	Total Converted marks	/50			

Note: Above information is for the benefit of students and parents. In case of any discrepancy departmental record will be treated as final.

GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR MD IN RADIODIAGNOSIS

Preamble:

The purpose of PG education is to create specialists who would provide high quality health care and advance the cause of science through research & training.

The Goal of this program is to impart training in conventional and modern radiology and imaging techniques so that the post graduate student becomes well versed and competent to practice, teach and conduct research in the discipline of radiology. The student should also acquire basic knowledge in the various sub-specialities of radiology. These Guidelines also would also help to standardize Radiodiagnosis teaching at post graduate diploma (DMRD) level throughout the country so that it will benefit in achieving competent radiologist with appropriate expertise.

The purpose of this document is to provide teachers and learners illustrative guidelines to achieve defined outcomes through learning and assessment. This document was prepared by various subject-content specialists. The Reconciliation Board of the Academic Committee has attempted to render uniformity without compromise to purpose and content of the document. Compromise in purity of syntax has been made in order to preserve the purpose and content. This has necessitated retention of “domains of learning” under the heading “competencies”.

SPECIFIC LEARNING OBJECTIVES

The objective of the program is to train a student to become a skilled and competent radiologist to conduct and interpret various diagnostic/interventional imaging studies (both conventional and advanced imaging), to organize and conduct research and teaching activities and be well versed with medical ethics and legal aspects of imaging/ intervention.

SUBJECT SPECIFIC COMPETENCIES

A. Cognitive Domain

A post graduate student on completing MD (Radiodiagnosis) should acquire knowledge in the following areas, and be able to:

1. Acquire good basic knowledge in the various sub-specialties of radiology such as chest radiology, neuro-radiology, GI-radiology, uro-radiology, cardio-vascular-radiology, musculoskeletal, interventional radiology, emergency radiology, pediatric radiology and women’s imaging.

2. Independently conduct and interpret all routine and special radiologic and imaging investigations.
3. provide radiological services in acute emergency and trauma including its medico-legal aspects.
4. Elicit indications, diagnostic features and limitation of applications of ultrasonography, CT and MRI and should be able to describe proper cost-effective algorithm of various imaging techniques in a given problem setting.
5. Decide on the various image-guided interventional procedures to be done for diagnosis and therapeutic management.
6. Able to decide on further specialization to be undertaken in any of the branches in Radiodiagnosis such as gastrointestinal radiology, uro-radiology, neuro-radiology, vascular radiology, musculoskeletal radiology, interventional radiology etc.
7. Able to formulate basic research protocols and carry out research in the field of radiology- related clinical problems.
8. Acquire knowledge and teaching capabilities to work as a post graduate student /consultant in Radiodiagnosis and conduct teaching programmes for undergraduates, post graduates as well as paramedical and technical personnel.
9. interact with other specialists and super-specialists so that maximum benefit accrues to the patient.
10. Should be able to organize CME activities in the specialty utilizing modern methods of teaching and evaluation.
11. Acquire knowledge to impart training in both conventional radiology and modern imaging techniques so that the post graduate student is fully competent to practice, teach and do research in the broad discipline of radiology including ultrasound, Computed Tomography and Magnetic Resonance Imaging.
12. Acquire knowledge of interventional radiology.

B. Affective Domain:

1. Should be able to function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the patient and the clinician or other colleagues to provide the best possible diagnosis or opinion.

2. Always adopt ethical principles and maintain proper etiquette in dealings with patients, relatives and other health personnel and to respect the rights of the patient including the right to information and second opinion.

3. Develop communication skills to word reports and professional opinion as well as to interact with patients, relatives, peers and paramedical staff, and for effective teaching.

C. Psychomotor domain

Practical Training will include two major aspects:

A) Interpretation of images, and

B) Skill in performing a procedure.

A) Interpretation of images:

The student should be able to interpret images on all imaging modalities of diseases of following organs :

1. **Musculo-skeletal System -** Interpretation of diseases of muscles, soft tissue, bones and joints including congenital, inflammatory, traumatic, endocrine and metabolic, neoplastic and miscellaneous conditions.
2. **Respiratory System -** Interpretation of diseases of the chest wall, diaphragm, pleura and airway; pulmonary infections, pulmonary vasculature; pulmonary neoplasm; diffuse lung disease; mediastinal disease, chest trauma; post-operative lung and X-ray in intensive care.
3. **Cardiovascular System** - Interpretation of diseases and disorders of cardiovascular system (congenital and acquired conditions) and the role of imaging by conventional radiology, ultrasound, colour Doppler, CT, MRI, Angiography and Isotopes Studies.
4. **Gastro-intestinal tract and hepato-biliary pancreatic system** - Interpretation of diseases and disorders of mouth, pharynx, salivary glands, esophagus, stomach, small intestine, large intestine, diseases of omentum, peritoneum and mesentery: acute abdomen, abdominal trauma. Diseases and disorders of liver, biliary system and pancreas**.**
5. **Urogenital System** - Interpretation of various diseases and disorders of genitor-urinary system. These include: congenital, inflammatory, traumatic, neoplastic, calculus disease and miscellaneous conditions.
6. **Central Nervous System (C.N.S.) -** Interpretation of diseases and disorders of the head, neck and spine covering, congenital, infective, vascular, traumatic neoplastic degeneration metabolic and miscellaneous condition.
7. Imaging in Emergency Medicine.
8. Imaging in Obstetrics and Gynecology.
9. Imaging of Breast and interventional procedures.
11. ENT, EYE and Dental Imaging**.**
11. Imaging of endocrine glands and those involved with metabolic diseases.
12. Clinical applied radionuclide imaging.
13. Interventional Radiology

B) Skills in performing a procedure

The student should be able to perform the following procedures:

1) **GIT contrast studies:** Barium studies (swallow, upper GI, Follow through, enema);

fistulogram; sialogram; cologram/ileostogram,

2) **GU:** Excretory urography, MCU, RGU, nephrostogram, genitogram,
3) **Ultrasound:** Studies of whole body including neonatal transfontanell studies, Doppler studies,
4) **CT scan:** should be able to position a patient, plan study as per the clinical indication, do reconstruction of images, perform triple phase study, perform & interpret advanced applications like CT enterography, CT angiography etc.
5) **MRI:** plan and perform MRI studies of whole body
6) **DSA:** should be able to describe the techniques, do (if available to student) transfemoral puncture and insert catheter, help in angiographic procedures both diagnostic and interventional.
7) **Radiography:** should be able to independently do radiography of common and some important uncommon views of different body parts. This includes positioning, centering of X ray beam, setting of exposure parameters, exposing and developing the films. The student should be familiar with not only conventional radiography but with CR and DR systems.
8) **Interventional radiology:** The student should be able to perform simple, common non- vascular procedures under ultrasound and fluoroscopy guidance e.g. abscess drainage, drainage catheter placement, nephrostomy, biliary drainage etc. The student should have knowledge of common vascular interventions e.g stricture dilatation using balloon catheters, embolization with gel foam and other agents, names of common catheters, handling of intravenous contrast reactions; techniques, indications and contraindications for various procedures;

Syllabus

Course contents:

Anatomy

Gross and cross sectional anatomy of all the body systems.

Pathology

Gross morphology of pathological conditions of systemic diseases affecting all organ systems.

Radiology Course

This would cover imaging and interventions of diseases affecting all the body systems:

- Chest
- Cardiovascular system
- Musculoskeletal including soft tissue
- Gastrointestinal system
- Hepato-biliary-pancreatic system
- Urogenital (genito-urinary) system

- CNS including head and neck
- Obstetrics and gynaecology
- ENT, eye, dental, breast
- Endocrine and metabolic system
- Clinically applied radionuclide imaging

Radiological Physics

1. Introduction of general properties of radiation and matter: Fundamentals of nuclear physics and radioactivity
2. Interaction of x-rays and gamma rays with matter and their effects on irradiated materials
3. X-ray Generating Apparatus
4. Screen-film radiography
5. Film processing: Dark room, dry processing, laser /dry chemistry cameras, artifacts.
6. Fluoroscopy: Digital including flat panel units, fluoroscopy cum radiography units
7. Digital radiography: Computed Radiography, Flat panel radiography
8. Other equipments: Ultrasound including Doppler, CT, MRI and DSA
9. Contrast Media (Iodinated, MR & Ultrasound) - types, chemical composition, mechanism of action, dose schedule, route of administration, adverse reaction and their management
10. Nuclear Medicine: Equipments and isotopes in various organ systems and recent advances
11. Picture Archiving and Communication System (PACS) and Radiology Information System (RIS) to make a film-less department and for Teleradiology
12. Radiation protection, dosimetry and radiation biology
13. Image quality and Quality Assurance (QA)
14. Recent advances in radiology and imaging

The student should have knowledge of the following physics experiments:

- Check accuracy of kVp and timer of an X ray unit
- Check accuracy of congruence of optical radiation field
- Check perpendicularity of x ray beam
- Determine focal spot size
- Check linearity of timer of x ray unit
- Check linearity of mA
- Verification of inverse square law for radiation
- Check film screen contact
- Check film screen resolution
- Determine total filtration of an x ray unit
- Processor quality assurance test

- Radiological protection survey of an x ray unit
- Check compatibility of safe light
- Check performance of view box
- Effect of kVp on x ray output

Radiography and processing techniques

1. Processing techniques: includes dark room and dry processing.
2. Radiography of the musculo-skeletal system including extremities.
3. Radiography of the chest, spine, abdomen and pelvic girdle.
4. Radiography of the skull, orbit, sinuses.
5. Contrast techniques and interpretation of GI tract, hepato-biliary tract, pancreas etc.
6. Contrast techniques and interpretation of the Central Nervous system.
7. Contrast techniques and interpretation of the cardiovascular system including chest.
8. Contrast techniques and interpretation of the genito - urinary system including Obstetrics and Gynaecology.
9. Paediatric radiology including MCU, genitogram, bone age.
10. Dental, portable and emergency (casualty) radiography.

TEACHING AND LEARNING METHODS

The training is spread over 3 years and includes following components:

1. Physics related to imaging
2. Rotational posting in various sub-specialties.
3. Seminars, case discussion, journal club**.**
4. Research methodology and statistics.
5. A log book should be maintained by the student and will be checked and signed regularly by the faculty-in-charge during the training program.
6. The postgraduate students shall be required to participate in the teaching and training program of undergraduate students and interns.
7. The postgraduate student would be required to present one poster presentation, to read one paper at a national/state conference and to submit one research paper which should be published or accepted for publication or sent for publication to a peer reviewed journal, during the period of his/her postgraduate studies so as to make him/her eligible to appear at the postgraduate degree examination.
7. Department should encourage e-learning activities.

Rotations:

During the three-year course, suggested rotations are as follows:-

1.	Conventional chest, abdomen, musculoskeletal including skull, spine, PNS and mammography etc	8 months
2.	Contrast studies: G.U., GIT, Hepato-biliary, angiography etc including fluoroscopic guided interventions	8 months
3.	US, Doppler and US guided interventions	8 Months
4.	CT and CT guided interventions	6 Months
5.	Emergency radiology	2 Months
6.	M.R.I.	2 Month
7.	Elective posting	2 Months

During each posting, post graduate student should be able to perform the procedures and interpret the findings.

PROPOSED SCHEDULE FOR ROTATION

1ST Year (1/6)	Conventional Chest & abdomen	Conventional skull, spine, musculo-skeletal etc.	US	Contrast studies - GIT & other fluoroscopic investigations	Contrast studies - G.U. tract	US
(2/6)	US & interventions	Conventional skull, spine, musculo-skeletal etc.	CT	Contrast studies -- GIT & other fluoroscopic investigations	Contrast studies - G.U. tract	US & interve-ntions
2nd Year (3/6)	Conventional Chest & abdomen	Contrast studies - GIT & other fluoroscopic investigations including angiography	Contrast studies - G.U. tract	US & interventions	Emergency	CT
(4/6)	Conventional skull, spine, musculo-skeletal etc.	Contrast studies - G.U. tract including pediatric MCU/genito-gram	US & interven-tions	US & Doppler	Emergency	MRI
3rd year (5/6)	Conventional Chest & mammo-graphy	Contrast studies - GIT & other fluoroscopic investigations including angiography	US & Doppler	Emergency	CT & inter-ventions	Elective
(6/6)	Conventional musculo-skeletal & mammo-graphy	Contrast studies - G.U. tract including pediatric MCU/genito-gram	CT& inter-ventions	CT & inter-ventions	MRI	Elective

During the training programme, patient safety is of paramount importance; therefore, skills are to be learnt initially on the models, later to be performed under supervision followed by performing independently. For this purpose, provision of skills laboratories in medical colleges is mandatory.

ASSESSMENT

FORMATIVE ASSESSMENT, during the training programme

Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self directed learning and ability to practice in the system.

General Principles

Internal Assessment should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills. The Internal Assessment should be conducted in theory and practical/clinical examination.

Quarterly assessment during the MD training should be based on:

1. **Journal based / recent advances learning**
2. **Patient based /Laboratory or Skill based learning**
3. **Self directed learning and teaching**
4. **Departmental and interdepartmental learning activity**
5. **External and Outreach Activities / CMEs**

The student to be assessed periodically as per categories listed in postgraduate student appraisal form (Annexure I).

SUMMATIVE ASSESSMENT, i.e., assessment at the end of training

The summative examination would be carried out as per the Rules given in **POSTGRADUATE MEDICAL EDUCATION REGULATIONS, 2000.**

Postgraduate Examination

The Post Graduate Examination was conducted in three parts.

1. **Thesis:**

   Every post graduate student shall carry out work on an assigned research project under the guidance of a recognized Post Graduate Teacher, the result of which shall be written up and submitted in the form of a Thesis (Dissertation). Work for writing the Thesis is aimed at contributing to the development of a spirit of enquiry, besides exposing the post graduate student to the techniques of research, critical analysis, acquaintance with the latest advances in medical science and the manner of identifying and consulting available literature.

   Thesis shall be submitted at least six months before the Theory and Clinical /

Practical examination. The thesis shall be examined by a minimum of two external examiners, who shall not be the examiners for Theory and Clinical examination. A post graduate student shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners.

2. Theory Examination

The examinations shall be organized on the basis of 'Grading' or 'Marking system' to evaluate and to certify post graduate student's level of knowledge, skill and competence at the end of the training. Obtaining a minimum of 50% marks in 'Theory' as well as 'Practical' separately shall be mandatory for passing examination as a whole. The examination for M.D. shall be held at the end of 3rd academic year. An academic term shall mean six month's training period**.**

There shall be four theory papers:

Paper I: Basic sciences related to Radiology (consists of Anatomy, Pathology, Basic and Radiation Physics, Imaging Techniques, and Film processing).

Paper II: Chest, CVS, CNS including Head & Neck, Eye, ENT, musculo-skeletal, pediatric radiology and Mammography.

Paper III: Abdominal Imaging including GI, GU, Hepatobiliary, endocrine and metabolic, Obstetrics and Gynaecology and Interventional radiology

Paper IV: Recent advances, nuclear medicine; Radiology related to clinical specialties

All papers would consist of short answer questions (minimum 10) covering all aspects of the course.

3. Practical/clinical and oral Examination (will include cases, spots, ultrasound procedure, physics, implements etc)

Practical Examination will have:

1. 3-4 Cases
2. Film Quiz (50 – 60 Spots)
3. To perform Ultrasound on a patient

Oral/Viva voce will include:

- Radiation Physics and quality assurance
- Implements, Catheters and contrast
- Cassettes, films, dark room, equipment
- Radiographic techniques, Radiological procedures,
- Gross pathology

Suggested Reading:

Books (latest edition)

1. Grainger & Allison's Text book of Diganostic Radiology (Churchill Livingstone)
2. Textbook of Gastrontestinal Radiology- Gore and Levine (Saunders)
3. MRI of Brain and Spine - Scott Atlas (LWW)
4. Diagnosis of Diseases of the Chest -Fraser
5. Diagnostic Imaging Series: (Amirsys, Elsevier)
   Abdominal Imaging, Orthopedics, Head and Neck, Neuroradiology, Pediatric Radiology Chest, Obstetrics, Breast
6. MRI in Orthopedics and Sport Injuries - Stoller
7. Skeletal Radiology - Greenspan
8. Abdominal-Pelvic MRI - Semelka (lWW)
9. Caffey's Pediatric Radiology
10. CTI and MRI of the whole body- John R. Haaga
11. Text Book of Radiology and imaging - Davod sulton
12. Diagnostic ultrasound - Carol C. Rumack
13. AIIMS-MAMC-PGI's Comprehensive Textbook of Diagnostic Radiology, Volumes 1, 2, 3

Journals

03-05 international Journals and 02 national (all indexed) journals

1. ~~American Journal of Roentgenology~~
2. ~~Radiology~~
3. ~~Seminars in Ultrasound, CT, MRI~~
4. ~~Radiographics~~
5. ~~Clinical Radiology~~
6. ~~British Journal of Radiology~~
7. ~~Radiological Clinics of North America~~
8. ~~Pediatric Radiology~~
9. ~~Australasian Radiology~~
10. ~~Journal of Computerized Axial Tomography~~
11. ~~Clinical Imaging~~
12. ~~MR Clinics of North America~~
13. ~~Seminars in Roentgenology~~

Medical Council of India

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Annexure I

Postgraduate Students Appraisal Form
Pre / Para /Clinical Disciplines

Name of the Department/Unit :

Name of the PG Student :

Period of Training : FROM.....TO.....

Sr. No.	PARTICULARS	Not Satisfactory	Satisfactory	More Than Satisfactory	Remarks
		1 2 3	4 5 6	7 8 9	
1.	Journal based / recent advances learning				
2.	Patient based /Laboratory or Skill based learning				
3.	Self directed learning and teaching				
4.	Departmental and interdepartmental learning activity				
5.	External and Outreach Activities / CMEs				
6.	Thesis / Research work				
7.	Log Book Maintenance				

Publications **Yes/ No**

Remarks* _____
_____
_____
_____

***REMARKS: Any significant positive or negative attributes of a postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.**

SIGNATURE OF ASSESSEE **SIGNATURE OF CONSULTANT** **SIGNATURE OF HOD**

Medical Council of India

Passed by Academic Council (Resolution No. 355/2006) dtd. 30/05/2006, subject to Uniformity in the Examination pattern.

The Curriculum

Goals

The goals of postgraduate training course in Surgery would be to train a MBBS doctor who will Practice surgery efficiently and effectively backed by scientific knowledge and skill .
No syllabus can be comprehensive but the following topics are not intended to be prescriptive but it is a guide to the topics which need to be covered during training.
At the end of the training and evaluation,

• He will develop right attitudinal skills which will ensure effective and correct communication with patients, relatives, colleagues and superiors
• Continue to develop keen interest in continuing surgical education irrespective of whether he is in a teaching institution or is in Private practice
• Be a motivated 'teacher' - defined as a surgeon keen to share his knowledge and skills with a colleague or a junior or any learner.

Objectives of the Course

The following objectives are laid out to achieve the goals of the course. These objectives are to be achieved by the time the candidate completes the course. The objectives may be considered under the subheadings

1. **Knowledge (Cognitive domain):** Knowledge and information about the subject, Recall of and Analysis of available information to be used for the treatment of patients.
2. **Skills (Psycho motor domain)**: The correct skills to be developed by working in a dry lab as well as surgeries on animals (Minimal access Surgery). He/She should develop surgical skills by assisting seniors as well as being assisted by seniors
3. **Human values**: Ethics involved in Surgical practice

At the end of the training, the candidate must be able to:

Knowledge:

• Describe etiology, pathophysiology, principles of diagnosis and management of common surgical problems including emergencies, in adults and children.
• The candidate should be conversant with Homeostatic mechanism and Fluid Electrolyte balance and replacement therapy including blood transfusion, plasma expanders and treatment of various types of shock.

• Nutrition : Assessment, Management of parenteral and enteral nutrition

•Disorders of coagulation pertaining to surgeries, DVT , Thrombophilia

• Describe common malignancies in the country and their management

• Recognize conditions that may be outside the area of his specialty / competence and appropriate referral to specialist

• Advise regarding the operative or non-operative management of the case and to carry out this management effectively.

• Update himself by self-study and by attending courses, conferences and seminars relevant to surgery.

• Teach and guide his team, colleagues and other students.

• Undertake audit, use information technology tools and carry out research, both basic and clinical, with the aim of publishing his work and presenting his work at various scientific forums.

Skills

• Take a proper clinical history, examine the patient, perform essential diagnostic procedures and order relevant tests and interpret them to come to a reasonable diagnosis about the surgical condition.

• Perform *minor* operative procedures and common general surgical operations independently and the *major* procedures with help from a senior surgeon.

• provide basic and advanced life saving support services (BLS & ALS) in emergency situations

• manage acute abdominal emergencies and poly trauma.

• Undertake thorough wound management, including burn wounds.

• Undertake complete patient monitoring including the preoperative and post operative care of the patient.

•Use of antibiotics in Surgery, Surgical infections' & use of Prophylactic antibiotics

Human values, Ethical practice and Communication abilities

• Adopt ethical principles in all aspects of his surgical practice. Professional honesty and integrity are to be fostered. Surgical care is to be delivered irrespective of the social status, caste, creed or religion of the patient.

• Develop communication skills, in particular the skill to explain various options available in management and to obtain a true informed consent from the patient.

• Provide leadership and get the best out of his team in a congenial working.atmosphere.

• Apply high moral and ethical standards while carrying out human or animal research.

• Be humble and accept the limitations in his knowledge and skill and to ask for help from colleagues when needed.

• Respect patient's rights and privileges including patient's right to information and right to seek a second opinion.

Course Contents

Essential Knowledge

A list of objectives related to knowledge and higher cognitive abilities that are expected to be achieved during the course is given. The course contents have been identified and categorized as essential knowledge as under. This is to enable the student to achieve the objectives of the course. It is recognized that General surgery today mainly covers Gastrointestinal & Hepatobiliary disorders, basic urological problems, abdominal wall herniae, Breast & thyroid disorders, knowledge of some common problems in allied specialities. Further he should be familiar with complications, current controversies and recent advances in these topics.

The topics are considered under:

- Basic sciences,
- General Surgery topics and
- Specialty topics.

There will be an overlap between the General surgery and specialty categories.

Basic sciences include anatomy, physiology, biochemistry, microbiology and pathology and Radiology, as found in current text books. These standard topics are recommended to be studied as much as they are applicable to the practice of surgery.

General Surgery Topics include the following:

History of surgery

Clinical History and examination - detailed systematic history taking, clinical examination of various systems, coming to a provisional working diagnosis.

Rationale of diagnostic tests - Ordering diagnostic tests with prioritizing the needs,based on the clinical, hospital and the patient's socioeconomic condition

Informed consent / Medico legal issues - Understanding the implications of acts of omission and commission in practice. Issues regarding Consumer Protection Act. - Implications in a medico-legal case like accidents, assaults etc.

Concept of Essential Drugs and Rational use of drugs

Pharmacoeconomics

Surgical audit - Understanding the audit of process and outcome. Methods adopted for the same.

Basic statistics

Evidence based medicine - Understanding journal based literature study;
the value of text book, reference book articles; value of review articles; original articles and their critical assessment. Understanding the value of retrospective, prospective, randomized controlled and blinded studies. - Understanding the principles and meanings various biostatistical tests applied in these studies.

Use of computers in surgery: Retrieval of important information, Record keeping, Powerpoint presentations for teaching, Statistical methods

Preoperative evaluation of patients with Co-morbid conditions

Principles of operative surgery like asepsis, antisepsis, sterilization. Basic surgical techniques; properties of suture materials; appropriate use of sutures, drains, prosthetic grafts. Postoperative care - concept of recovery room care; airway management; assessment of wakefulness; management of cardiovascular instability in this period. Post operative pain management as well as care of terminally ill patients especially cancer patient. Basic surgical instrumentation - Principles of surgical instrumentation; their maintenance and troubleshooting. Familiarize with minimal access surgery instruments, Diathermy & lasers.

Wound management: wound healing; factors influencing healing;
Assessment of trauma; Assessment of head, chest and abdominal trauma and triage - Assessment of a trauma victim; resuscitation; care at the site; triage; care in the accident department; criteria for immediate surgery; immediate workup and logical referral criteria. Multiple injured patient, closed abdominal and chest injuries, penetrating injuries; fractures pelvis; urological injuries; vascular injuries; trauma scores.

Surgical infections - asepsis and antisepsis; microbiological principles; rational use of antibiotics; special infections like synergistic gangrene and diabetic foot infections. Hepatitis and AIDS

Surgical nutrition - nutritional assessment; metabolic response to stress; need for nutritional support; enteral nutrition; routes of access to GI tract; parenteral nutrition; access to central veins for nutritional support.

Acute abdomen - Appendicitis / Peritonitis / Perforated viscus / Intestinal obstruction

Hernias - simple and complicated - various types of hernias; their repair; prosthetic materials

Critical care - Cardiorespiratory failure - management of shock; including monitoring; sepsis scores; pharmacological support.

Fluid and electrolyte balance / Acid - Base metabolism - The body fluid Compartments; metabolism of water and electrolytes; factors maintaining homeostasis; causes for and treatment of acidosis and alkalosis.

Pain control - acute and chronic pain; cancer and non-cancer pain; patient controlled analgesia.

Principles of oncology - cell kinetics; causation of tumours; principles of oncologic surgery, radiotherapy and chemotherapy; paraneoplastic syndromes; cancer pain management; palliative care

Principles of burn management - types of thermal injury; assessment of extent; immediate management; late management; skin cover; rehabilitation

Principles of fracture management - fracture healing; principles of immobilization; complications; principles of internal fixation.

Airway obstruction / management - anatomy of the airway; principles of keeping the airway patent; mouth to mouth resuscitation; oropharyngeal airway; endotracheal intubation; crico-thyroidetomy; tracheostomy.

Breast disease - benign and malignant disease; diagnosis; investigation; screening for cancer; genetics of breast cancer

Thyroid disease - solitary nodule; investigations; multinodular goiter; Hashimoto's disease; cancer

Specialty Topics Include

GI endoscopy and Laparoscopy:

Principles of GI endoscopy

Diagnostic and therapeutic GI endoscopy including upper GI, lower GI and pancreato-biliary systems.

Physiology of pneumoperitoneum. Diagnostic laparoscopy & Laparoscopic therapeutic procedures

Neurosurgery :

Head and neck trauma; acute management and rehabilitation

Concept of brain death / medico-legal implications

Peripheral nerve injuries

Neoplasms of the brain and meninges

Acute and chronic infections of the brain and meninges

Hydrocephalus

Spinal injuries

Monitoring intracranial tension

Urology:

Urological injuries

Urothelial tumours / Chemotherapy

Prostatic hypertrophy

Hypospadias

Pyelonephritis / perinephric abscess

GU tuberculosis

Scrotal disease

Endourology

Peritoneal dialysis / CAPD / haemodialysis

Transplantation / harvesting kidney

Urinary diversion

Infertility / Vasectomy

Pyeloplasty / hydronephrosis

Oncology:

Breast, thyroid and GI malignancies

Chemotherapy / Adjuvant therapy

Head and neck tumours

Imaging CT/ MRI CT guided FNAB/C

Post excision reconstruction

Radiotherapy

Plastic Surgery

Burns management

Cleft lip and palate

Congenital defects of hand

Details of skin flap

Facial injuries

Hand injuries / tendon injury

Hypospadias

Nerve repair

Pressure sores .

Principles of microsurgery

Principles of tissue transfer

Vascular repair

Cardio-thoracic surgery

Flail chest / thoracic trauma Bronchogenic carcinoma Lobectomies

Pneumonectomy

Endocarditis prophylaxis

Pulmonary function tests

Control of major haemorrhage

Operations on the diaphragm

Coronary artery disease

Valvular heart disease

Lobectomies and pneumonectomies

Oesophageal disease

Operations on thoracic aorta

Mediastinal tumours

Basics of congenital heart disease

Vascular Surgery

Vascular imaging

A V malformations

Exposure of major arteries and veins / vascular anastamosis

Varicose veins

Chronic venous insufficiency.

Vascular emergencies - trauma, embolism

Peripheral vascular disease - Atherosclerosis, arteritis

Details of vascular prosthesis

Paediatric Surgery

Fluid and electrolyte management

Preparation for surgery / post op care

Hernias

Spinal fusion defects Ventral defects

Operative Skills:

Emergency Room Procedures

Application of Splints for Fractures
Arterial and Venous Lines
Assessment and initial management of Poly trauma
Cardiopulmonary Resuscitation
Management of Airway Obstruction
Management of Shock and Cardiac Respiratory failure

Pre-operative Workup

Ability for adequate pre-operative preparation in special situations like Diabetes, renal failure, cardiac and Respiratory failure etc. and risk Stratification
Communication skills with special reference to obtaining Informed Consent
Proper pre-operative assessment and preparation of patients including DVT prophylaxis, Blood transfusion and Antibiotics

Post-operative Care

Airway management
Basic Physiotherapy
Management of epidural analgesia
Management of Fistulae
Management of postoperative hypo and hypertension
Postoperative pain control
Skills for Nutritional rehabilitation of patients
Skills for proper Fluid & Antibiotic management
Stoma care

Minor O. T. procedures

Circumcision under Local Anesthesia
Drainage of Abscesses
FNAC
Major dressings
Minor Anorectal Procedures (Haemorrhoids -Banding, Cryotherapy, suturing etc.
Anal dilatation and Fissures), Fistulectomy
Minor Biopsies - Lymph node, ulcer, swellings etc.,
Reduction and plaster application of simple fractures and dislocations
Removal of simple subcutaneous swellings
Sigmoidoscopy and Upper OJ. endoscopy
Suturing Techniques
Vasectomy
Wound debridement

Major Operating room techniques

Instrument anangement and trolley layout
Skills in Sterilization techniques, O.T.Layout and Asepsis
Skin preparation - painting and draping
Technique of scrubbing and gowning

General Surgical Operative Procedures

Appendicectomy

Cholecystectomy

Closure of Colostomy

Closure of peptic ulcer / under-running bleeding ulcer / vagotomy drainage

Colostomy

Cysts and sinuses of the neck

Diagnostic laparoscopy

Drainage of breast abscess / Excision of breast lump

Groin Hernia repair

Gynaecomastia

Haemorrhoidectomy / Fissurectomy / simple fistulectomy

Hemicolectomy

Herniotomy / Orchidopexy in children

Laparotomy for abdominal trauma / splenectomy

Laparotomy for intestinal obstruction / bowel resections / bowel anastamosis Management of complex wounds

Mastectomy

Opening and closing the abdomen

Opening and closing the chest

Parotidectomy

Release of bands and simple adhesive obstruction

Thyroid lobectomy

UGI endoscopy / Flexible sigmoidoscopy

Ventilation

Wide excision of breast tumours / mastectomy / microdochectomy

Gastrostomy / Feeding jejunostomy

Speciality Procedures

There will be repetition of the procedures listed under this category and those listed under General surgical procedures.

Laparoscopy And GI Endoscopy

Diagnostic and therapeutic Upper and Lower GI endoscopy

Diagnostic laparoscopy

Diagnostic Upper GI endoscopy

Laparoscopic Cholecystectomy

Neurosurgery

Craniotomy
Management of paraplegia
Peripheral nerve repair
Treatment of nerve injury specific operations
Suturing complex scalp wounds
Trephining

Urology

Carcinoma penis
Diagnostic cystoscopy
Inguinal Block Dissection
Meatotomy
Nephrectomy - partial & total
Nephrolithotomy
Orchidectomy
Orchidopexy
Retroperitoneal lymph node dissection
Supra pubic cystostomy
Total amputation of penis
TURP / Open prostatectomy
Ureterolithotomy
Urethral J Urogenital injuries
Urethral dilatation
Varicocele
Vasectomy

Oncology

All radical operations - Breast, Thyroid, GI and Facio-maxillary malignancies
Breast lumpectomy
Functional neck node dissection
Gastrectomy / Bowel resection
Metastatic workup

Plastic Surgery

Burn resuscitation

Lip surgery

Local blocks in anaesthesia

Minor hand injuries

Nerve repair

Post excision reconstruction

Reimplantation of digits

Skin flap surgery

Stitch craft

Tendon repair PA

Wound debridement

Paediatric Surgery

Anorectal anomalies

Circumcision I meatoplasty

Herniotomy

Intercostal aspiration

Laparotomy for peritonitis

Lymph node biopsy

Non operative treatment of volvulus

Orchidopexy

Ostomies

Paediatric emergencies

pyloromyotomy

Cardiothoracic Surgery (Not essential)

Canulation of artery and vein

Chest injuries PA

Empyema drainage / decortication

Endotracheal intubation

Intercostal drainage

Lobectomies and pneumonectomies

Oesophageal surgery

Opening and closing the chest

Operations on the root of the neck

Pericardiectomy

Removal of FBs

Remove pulse generator (pacing)

Rib resection PA

Tracheos tom y

Undertake sternotomies

Vein and arterial harvesting

Ventilator management

Vascular Surgery

Teaching and Learning Activities

A candidate pursuing the course should work in the institution as a full time student.He should be included in Residency program No candidate should be permitted to run a clinic/laboratory/nursing home while studying postgraduate course. Each year should be taken as a unit for the purpose of calculating attendance.

Every student shall attend teaching and learning activities during each year as prescribed by the department and not remain absent himself / herself from work without valid reasons.

A list of teaching and learning activities designed to facilitate students acquire essential knowledge and skills outlined is given below. Depending on the facilities available, any or all of these methods may be employed.

1.**Lectures:** Lectures are to be kept to a minimum. They may, however, be employed for teaching certain topics. Lectures may be didactic or integrated.

a)Didactic Lectures: Recommended for selected common topics for post graduate students of all specialities. Few topics are suggested as examples:

1)Bio-statistics

2)Use of library

3)Research Methods

4)Medical code of Conduct and Medical Ethics

5)National Health and Disease Control Programmes

6) Communication Skills etc.

These topics may preferably taken up in the first few weeks of the 1st year.

b)Integrated Lectures: These are recommended to be taken by multidisciplinary teams for selected topics, eg Jaundice, Diabetes mellitus, Thyroid Topics to bs taken by Basic sciences specialist etc.

2.**Journal Club:** Recommended to be held once a fortnight All the PG students are expected to attend and actively participate in discussion and enter in the Log Book relevant details. Further, every candidate must make a presentation from the allotted journal(s) of selected articles at least two times a year and a total of 6 presentations in three years. The presentations would be evaluated using check lists and would carry weightage for internal assessment. A time table with names of the student and the moderator should be announced at the beginning of every year.

3.Subject Seminar: Recommended to be held once a month All the PG students are expected to attend and actively participate in discussion and enter in the Log Book relevant details. Further, every candidate must present on selected topics ai least" four times a year and a total of 12 seminar presentations in three years. The presentations would be evaluated using check lists and would carry

weightage for internal assessment (See Checklist II of Internal Assessment). A timetable for the subject with names of the student and the moderator should be scheduled at the beginning of every year.

4.Student Symposium: Recommended as an optional multi disciplinary programme. The evaluation may be similar to that described for subject seminar.

5.Ward Rounds: Ward rounds may be service or teaching rounds.

a)Service Rounds: Postgraduate students and Interns should do ward rounds every day for the care of the patients. Newly admitted patients should be worked up by the PGs and presented to the seniors the following day.

b)Teaching Rounds: Every unit should have 'grand rounds' for teaching purpose. A diary should be maintained for day to day activities by the students.

Entries of (a) and (b) should be made in the Log book.

6.Clinico-Pathological Conference: Recommended once a month for all post graduate students. Presentation be done by rotation. If cases are not available due to lack of clinical postmortems, it could be supplemented by published CPCs.

7.Inter Departmental Meetings: Strongly recommended particularly with departments of Pathology and Radio-Diagnosis at least once a week. These meetings should be attended by post graduate students and relevant entries must be made in the Log Book.

Pathology: A dozen interesting cases may be chosen and presented by the post graduate students and discussed by them as well as the senior staff of Surgery department. The staff of Pathology department would then show the slides and present final diagnosis. In these sessions the advance immuno-histochemical techniques, the burgeoning markers other recent developments can be discussed.

Radio-diagnosis: Interesting cases and the imaging modalities should be discussed.

8.Teaching Skills:: Post graduate students must teach under graduate students (Eg. medical, nursing) by taking demonstrations, bed side clinics, tutorials, lectures etc.

Assessment is made using a checklist by surgery faculty as well students. Record of their participation be kept in Log book. Training of post graduate students in Educational Science and Technology is recommended.

9.**Continuing Medical Education Programmes** (CME) : At least 2 state level CME programmes should be attended by each student in 3years.

10.**Conferences:** Attending conferences is optional. However it should be encouraged.

11.**Dissertation** Every candidate pursuing MS degree course is required to carry out work on a selected research project under the guidance of a recognized post graduate teacher. The results of such a work shall be submitted in the form of a dissertation.

Rotation and posting in other departments

The listed knowledge and skills are to be learnt over a period of 3 years. The process is a continuous one. However the recommended period and timing of training in basic subjects, allied departments and speciality departments are given below.

In the first year, during the morning session, student should work in the parent department. It is recommended that 2 years and 4 months be spent in General Surgery and 8 months in allied and specialty departments. Depending on the time and opportunities available, some of the procedures listed for second year activity can be shifted either to the first or the third year. Students must be 'on call' on a regular basis. The total duration of postings in core and other specialities will be eight months.

Basic Sciences

Basic science should be an essential part of training. It should be done as concurrent studies during the 1 st year of training. At least two hours daily may be in the first six months of the course.

In the afternoons basic science teaching relevant to surgery can be done in the respective departments.

Topics for study to include Anatomy, Physiology, Pathology, Microbiology, Pharmacology, Anaesthesia and Radiology

Pathology - Concurent study - Recommend daily Grossing sessions, weekly Surgical pathology sessions and monthly Clinico Pathological Conferences. Radiology - Concurrent study - adequate exposure to modern imaging modalities like ultrasound sonography, CT scan, MRI and angiography.

Allied Specialty Subjects

Students should to be posted to core allied speciality subjects Viz. Anaesthesia and ICU for one month and Orthopaedics including trauma (accident and emergency) for 2 months during the second year of training. Posting to the Department of Obstetrics and Gynaecology for one month is optional. This posting may be in lieu of one of the other specialties (except the core specialties) depending on the choice of the candidate.

Other Surgical Speciality Subjects

Postings to other speciality departments will be during the second year. The departments and duration of postings are as under:

Department	Duration
• Paediatric surgery	4wks
• Plastic surgery	4wks
• Urology	4 wks
• Oncology	4 wks
• Cardiothoracic surgery	2 wks
• Neurosurgery	2 wks

Dissertation

1.The dissertation is aimed to train a post graduate student in research methods and techniques. It includes identification of a problem, formulation of a hypothesis, search and review of literature, getting acquainted with recent advances, designing of a research study, collection of data, critical analysis, comparison of results and drawing conclusions.

2.Every candidate shall submit to University in the prescribed proforma, a synopsis containing particulars of proposed dissertation worK within six months from the date of commencement of the course on or before the dates notified by the University. The synopsis shall be sent through the proper channel.

3.Such synopsis will be reviewed and the dissertation topic will be registered by the University. No change in the dissertation topic or guide shall be made without prior approval of the University.

4.The dissertation should be written under the following headings:

1.. Introduction
11. Aims or Objectives of study
111. Review of Literature
IV. Material and Methods
V. Results
VI. Discussion
V11. Conclusion
V11l. Summary
IX. References
X. Tables
Xl. Annexure

5.The written text of dissertation shall be not less than 50 pages and shall not exceed 150 pages excluding references, tables, questionnaires and other Checklists. It should be neatly typed in double line spacing on one side of paper (A4 size, 8.27" X 11.69") and bound properly. Spiral binding should be avoided. The dissertation shall be certified by the guide, head of the department and head of the Institution.

6.Four copies of dissertation thus prepared shall be submitted to the University, six months before final examination on or before the dates notified by the University.

7.The dissertation shall be valued by examiners appointed by the University. Approval of dissertation work is an essential precondition for a candidate to appear in the Universityexamination.

8.**Guide:** The academic qualification and teaching experience required for recognition by this University as a guide for dissertation work be as per Medical Council of India Minimum Qualifications for Teachers in Medical Institutions Regulations, 1998. Teachers in a medical college/institution having a total of eight years teaching experience out of which at least five years teaching experience as Lecturer or Assistant Professor gained after obtaining post graduate degree shall be recognised as post
graduate teachers. A **Co-guide** may be included provided the work requires substantial contribution from a sister department or from another medical institution recognised for teaching/ training by the University /Medical Council of India. The co-guide shall be a
recognised post graduate teacher

9.**Change of guide:** In the event of a registered guide leaving the college for any reason or in the event of death of guide, guide may be changed with prior permission from the university.

Practical Examination:

(As per Direction No. 01/2008 dtd. 26/05/2008)

SYLLABUS FOR POST GRADUATE DEGREE IN OBST. & GYNAECOLOGY (M.D.)

OBSTETRICS :

1. Basic sciences

A) Applied Anatomy in females of genito urinary system, abdomen, pelvis, pelvic floor, anterior abdominal wall and breast.

B) Anatomy of fetus

C) Fundamentals of reproduction

Gametogensis fertilization, implantation & early development of human embryo.

Placenta - development, structure, functions

Amniotic fluid - formation and function

Fetal growth & development, fetal physiology

Birth defects,Genetics & teratology & counselling.

Physiological changes during pregnancy, labour and puerperium

Endocrinology of pregnancy.

Lactation

Immunology of pregnancy

Molecular biology

2. Normal pregnancy, labour & puerperium.

Breast feeding - baby friendly initiative

3. Early recognition and prompt management of pregnancy complications, - Hyperemesis gravidarum, abortions, ectopic pregnancy, hydatidiform mole,

Pre-eclampsia, eclampsia, Pathophysiology of PIH,

Antepartum hemorrhage, multiple pregnancy, polyhydramnios, Oligohydramnios &Prolonged pregnancy.

4. Management of pregnancies complicated by medical,surgical or gynaecological diseases, in consultation with the concerned specialities by team approach.

* Anemia,Heart disease,diabetes mellitus, liver disorders,Respiratory diseases, Renal diseases**,** CNS disorder, Skin, Psychiatry

Hypertensive disorders .

* Acute abdomen, Acute Appendicitis, Intestinal obstruction, perforations.

- Fibroids, Ovarian tumors, Carcinoma cervix, genital prolapse.
- Recent advances in medical and surgical management.

5. Infections in pregnancy.

Malaria, Toxoplasmosis, viral infections (Rubella, CMV, Hepatitis B, Herpes) syphilis and Other sexually transmitted infections including HIV, Leptospirosis.

Parents to child transmission of HIV infection. (PPTCT)

6. Evaluation of the fetal and maternal health in complicated pregnancy by making use of available diagnostic modalities and plan for safe delivery of the fetus while safeguarding the maternal health. Identification of fetus at risk and management.

High risk pregnancy - Post caesarean pregnancy, prolonged gestation, preterm labour, fetal growth restriction, premature rupture of membranes, blood group incompatibility, recurrent pregnancy wastages. Imaging techniques, CTG

7. Prenatal diagnosis of fetal abnormalities and appropriate care. Fetal therapy. PNDT Act and its implications.
8. Partographic monitoring of labour progress, early recognition of dysfunctional labour and appropriate interventions during labour including active management of labour.
9. Obstetrical analgesia and anesthesia.
10. Induction and augmentation of labour.
11. Management of abnormal labour : Abnormal pelvis, soft tissue abnormalities in birth passage, Malpresentation and malpositions of fetus, abnormal uterine action, obstructed labour and cervical dystocia. Third stage complications - PPH including surgical management, retained placenta, uterine inversion, post partum collapse, amniotic fluid embolism.
12. Abnormal puerperium, Puerperal sepsis
Thrombophlebitis, Mastitis, Puerperal venous sinus thrombosis,Psychosis.
13. National Health Programmes to improve the maternal and child health, social obstetrics and vital statistics. (Maternal and Perinatal mortality)
14. Drugs used in obstetric practice including prostaglandins.FDA Classification
15.Coagulation disorders in obstetrics, Blood and component therapy.

16.Operative obstetrics - decision making, technique, recognition and management of complications - C.S. instrumental delivery, obstetrics hysterectomy, role of destructive surgery.Manipulations-version,MRP etc.
Forceps,Vaccum, Internal iliac artery ligation

17. Intensive care in obstetrics for critically ill patient. Fluid and electrolyte balance, volume status maintenance, protecting vital organ function.
18. Provision of safe abortion services - selection of case, techniques, and management of complications. Septic abortion, Criminal abortion, MTP Act Adoption laws.

NEW BORN

1. Care of newborn
care of preterm, S.G.A.neonates, infants of diabetec mother
2.Asphyxia & Neonatal resuscitation (Respiratory distress syndrome and Meconium aspiration syndrome)
3. Neonatal sepsis - prevention, Early detection & management.
4. Neonatal hyperbilirubinemia, investigation and management.
5. Birth trauma - prevention, early detection & management.
6.Detection of congenital malformations in new born and make timely referrals for surgical corrections.
7. Management of the common problems in neonatal period.

GYNAECOLOGY :

Basic sciences

Development of genital tract and associated malformations. Basics of breast diseases related to ob/gy

Applied anatomy of female genital tract, abdominal wall and urinary tract.

Physiology of menstruation and ovulation

Physiology of spermatogenesis

Endocrinology - hypothalamus pituitary, thyroid and adrenal glands Neurotransmitters

Common menstrual disorders and their management

3. Diagnosis and surgical management of clinical conditions related to congenital malformations of genital tract. Reconstructive surgery in gynaecology

4. Chromosomal abnormalities and intersex. Ambiguous sex at birth

5. Reproductive Endocrinology : Evaluation of primary and secondary amenorrhoea, management of hyperprolactinemia, Hirsutism, chronic anovulation and PCOD,. Thyroid dysfunction.

6. Endometriosis and adenomyosis - medical and surgical management.

7. Infertility evaluation and management. Use of ovulation induction methods and Tubal microsurgery, Assisted reproduction techniques , management of immunological factors in infertility. Adoption law, medico-legal and ethical issues.

8. Reproductive Tract Infections, Sexually Transmitted Infections, HIV/AIDS : Prevention, Diagnosis and management.Genital Tuberculosis.

9 Screening for genital malignancies - cytology, colposcopy and biochemistry. Management of premalignant lesions

10. Benign and malignant tumors of genital tract - Early diagnosis and management.
11. Principles and practice of oncology in gynaecology - chemotherapy, radiotherapy, palliative treatment.
12. Supports of pelvic organs , genital prolapse,surgical management of genital prolapse.
13. Common urological problems in gynaecology - SUI, voiding difficulties, VVF, urodynamics, surgical repair of genital fistulae, ureteric and bladder injuries**.**
14. Management of menopouse, prevention of complications, HRT, cancer screening - genital, breast.
15. Recent advances.
16. Newer diagnostic aids - USG, interventional sonography, other imaging techniques, endoscopy.
17. Hysteroscopy, laporoscopy - diagnostic, simple surgical procedures, including laparoscopic tubal occlusion , endometrial ablative techniques, colposcopy**.**
18. Medicolegal aspects, ethics, communications and counselling.(SEXUAL / ASSAULTS)
19. Operative gynaecology - Selection of case, technique and management of complications of minor and major gynaecology procedures.

- Abdominal and vaginal hysterectomy
- Surgical procedures for genital prolapse
- Surgical management of benign and malignant genital neoplasms.
- Repair of genital fistulae, SUI
- Operative endoscopy – Laparosocpic, Hysteroscopic

20. Recent advances in gynaecology - diagnostic and therapeutic
21. Special groups - Pediatric and adolescent gynaecology, geriatric gynaecology
22. Evidence based management

FAMILY PLANNING :

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1. Demography and population Dynamics.
2. Contraception - Temporary methods. Permanent methods (vasectomy and female sterilization) Legal issues.
3. MTP Act and procedures of MTP in first & second trimester.(Recent Amendments, Legal/ethical issues)
4. Emergency contraception.
5. Recent advances, New development, Future research work in contraceptive technology.

OBSTETRICS AND GYNAECOLOGY - M.D. EXAMINATION

(As per Direction No. 01/2008 dtd. 26/05/2008)

Recommended Books

OBSTETRICS

SN	Must Read	Desirable to Read	Good to read
1	C.S.Dawn's Text book of Obstetrics and Neonatology	Medical Disorders in Pregnancy by DeSwiet	High Risk pregnancy by James
2	Ian Donald Practical Obstetrics problems	Obstetrics by Ian Donald	Williams Obstetrics
3		Arias, High Risk Pregnancy	
4	Munro-Kerr's Operative Obstetrics	Progress in OBGY, Studd	Operative Obstetrics by Douglas
5			Recent Advances in Obst/Gyn
6			All on net
7			FOGSI Books

GYNECOLOGY

SN	Must Read	Desirable to Read	Good to read
1	Novacs Gynecology	Reproductive Endocrinology by Speroff	Gynecology Devherst
2	TeLindes Operative Gynecology	Infertility by Insler	All on net
3	C.S.Down's Textbook of gynecology and contraception	Endocrinology by Rajan	FOGSI Books
4	Bereks gynecological Oncology	Gynacology by Gold	
5	Gynecology by P.K.Devi		Shaws textbook of gynecology
6	Jeffcoat's Principles of Gynaecolgy	Bonney's Operative Gynecology	
7	Standard Operating Procedures in Obstetrics and Gynecology by Dr. shrinivas Gadappa	---	---

FAMILY PLANNING

SN	Must Read	Desirable to Read	Good to read
1	Family Planning Practices by S.K .Chaudhary	Reproductive endocrinology by Speroff	Population reports
2	C.S.Dawn’s book on Contraception		

Journals/ Periodicals;

SN	Must Read	Desirable to Read	Good to read
1	Clinic in Obst. & gynecology	Year books	Am J Obst Gynec
2	North Americal clinic in ObGy	Annuals	Br. J Obst Gync.
3	J. Obst. Gyn India		Obstet Gynec Survey
			Fertility & Sterility

Passed by Academic Council (Resolution No. 355/2006) dtd. 30/05/2006, subject to Uniformity in the Examination pattern.

SYLLABUS FOR POST GRADUATE COURSES IN OPHTHALMOLOGY

1. Every candidate for the post graduate courses in ophthalmology must have obtained the Bachelor of Medicine and Bachelor of Surgery Degree of this University.
2. He or She should complete two years and three years academic terms for Post-graduate Diploma and Degree course in Ophthalmology as per MCI norms.
3. Every candidate presenting himself for these courses must send to the registrar with his application for admission of registration the following certificates –

1. Certificate of having MBBS degree.
2. Maharashtra Medical Council Certificate.
3. Eligibility Certificate.
4. Simultaneous registration for degree and diploma courses shall not be permitted.
5. Holder of diploma in any subject are not been give any concession of duration for completing post – graduate degree.
6. The subject for study shall be

A) Anatomy and Embryology of Eye including the contents of the orbital bones in relation thereof and the central nervous system as far as it refers to eye.(this includes anatomy of each structure of the eyeball for e.g. – Cornea, Iris, Choroid, Retina, Lens, Vitreous, Lids, etc)

B) Physiology of the Eye – Which includes physiology of vision, optics, binocular vision, Aqueous secretions, tear secretion, metabolism of various structures of the ye like cornea, lens, etc.

C) Various errors of refraction and their principles and optics.

D) Ophthalmic Medicine and Surgery (All Diseases related to various structures of the eye for eg – Lid, Adnexa, Conjunctiva, Cornea, Uvea, Lens, Vitreous, Retina,optic Nerve, Extraocular muscles, Tumors .)

E) Pathology and Bacteriology of the Eye.

F) Relation of ophthalmology to general medicine.

G) Eye Banking and its aspects.

H) National Program for Control of Blindness and its applications in Community Ophthalmology.

I) Various new innovations in Ophthalmology for example like Lasers in Ophthalmology, New Drugs in Ophthalmology, New techniques in operative skills, various transplant surgeries like – Keratoplasty, Stem cells transplant, amniotic membrane transplant.

J) Therapeutics in Ophthalmology

K) Radio therapy in Ophthalmology.

EXAMINATION PATTERN – For M.S. Ophthalmology –
(As per Direction No. 01/2008 dtd. 26/05/2008)

Passed by Academic Council (Resolution No. 355/2006) dtd. 30/05/2006, subject to Uniformity in the Examination pattern.

MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES, NASHIK

SYLLABUS OF M.S. ORTHOPAEDICS

MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES

NASHIK - 422 005.

Syllabus for M.S. (Orth.)

Syllabus :

1) Basic Sciences Related to Locomotor system.

1) Development, histology of bone, cartilage, collagen, muscles and nerve.
2) Physiology of bone, carliage, muscle & nerve.

2) Surgical pathology related to bones, cartilage, muscle, collagen & nerve in various congenital affections, infections, Tumours and timorous conditions and metabolic affections.

3)Orthopaedic diseases

- Metabolic bone disease
- Bone infections – Acute and Chronic
- Congenital deformities and development conditions of upperextremity, lower extremity, spine general defects.
- Diseases of joints
- Tumours of Bones
- Orthopaedic Neurology including spine bifida, Poliomyelitis andcerebral palsy.
- Diseases of muscle, fibrous tissue and vessels
- Regional orthopaedic conditions related to neck, shoulder, elbow,wrist, hand, hip, knee, ankle , foot, back and pelvis.
- Special subject–Orthopaedic Radiology Amputation and disarticulation physiotherapy and rehabilitationRecent advances in orthopaedic diseases.

4)General principles of Surgery and Traumatology.

- Wound healing
- Fracture healing
- Rehabilitation after bone and joint injuries
- Systematic response to injury
- Acute trauma care and early management of injured
- Injury to head, face, chest, abdomen, vessels & nerves.
- Polytrauma
- Fracture & dislocations in all bones and joints including diagnosis, classifications, various modalities of investigation and operative non- operative treatment including complications.
- Fractures in children
- Pathological fractures
- Recent Advance in various fractures and complications management.

5)Exposure to surgical techniques & surgical approaches to various regions to manage common infection, tumor, joint diseases, different type of trauma, congenital, neurological and miscellaneous conditions.

6)Principles of Arthroscopy microsurgery & Arthroplasty.

7)Orthotics & Prosthetics, disability calculation, Bio-mechanics of gait, splints.

8)Thesis – Aim is to train the PG student in research work. Topics should be in experimental, clinical, retrospective analysis or combination such that students is encouraged to do exhaustive reference work. Topics should be relevant to subject and region of work. Topics should allotted within first three months of training. The candidate should complete review of literature by end of the first year and submit his completed thesis six months before the final examination. Subject of thesis should be approved by University within first six months.

9)Under Graduate teaching in clinical methods.

10)Seminar presentation on common topics.

11)Journal reading and discussion.

12)Case presentation, ward record maintenance.

13)Adequate experience in closed reducation of various fractures, as isting major operation, independent operative management of common orthopaedic condition.

14)Preparation of paper for presentation in conference.

15)Preparation of article for publication.

MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES

NASHIK - 422 005.

Scheme of Theory Exam. in Orthopaedics for M.S. (Ortho.) Exam.

(As per Direction No. 01/2008 dtd. 26/05/2008

Provisional Syllabus for Diploma in Orthopaedics

1) Basic Sciences related to Locornotor System

i) Histology of bone, cartilage, muscles, collagen, Nerves

ii) Physiology of bone, cartilage, muscles, collagen and Nerves

2) Surgical Pathology related to Bones, cartilage, Muscle, collagen and Nerves in various.

Congenital affection, infections, Tuirnours and turnours conditions a metabolic affection.

3) General principles of surgery and Traurratology

i) Wound healing

ii) Fracture healing

iii) Rehabilitation after bone and joint injury

iv) Systemic response to injury

v) Fracture and dislocation in all bones its management including complications.

vi) Injury to chest, abdomen and head

vii) Ploytrauma

viii) Fractures in children

4) Orthopaedics diseases

i) Metabolic Bone Disease

ii) Bone infections – Acute and chronic

iii) Congenital and development Deformities
- upper extremity
- Lower extremity
- Spine
- General defects

iv) Disease of joints

v) Tumours of Bones

vi) Orthopaedics Neurology – Spina bifida, Polio, Cerebral Palsy

vii) Disease of muscles, nerves , vessels and fibrous tissues

viii) Regional Orthopaedics related to spine, shoulder

ix) Elbow, wrist, hip, knee, ankle and foot.

x) Special Subjects
- Orthopaedics Radiology
- Amputation
- Physiotherapy
- ALTS
- First Aid

Examination Scheme for D. (Ortho)
(As per Direction No. 01/2008 dtd. 26/05/2008

Theory Exam. Total three papers, each of three hours duration and carrying 80 marks each. Total = 240 Marks.

Paper I	-	Anatomy, Physiology and Pathology as applicable to Orthopaedics.
Paper II	-	Traumatology and general Surgery,
Paper III	-	General Orthopaedics

Each paper will have four questions of 25 marks each.

Practical Exam.

Total Marks	=	300
Long Case 1	=	100
Short Case 2	50 X 2 =	100

Tables : 100

1) Instruments	=	20
2) X-rays	=	20
3) Specimen & Bones and splints	=	20
4) Ward round	=	20
5) Operation	=	20

Internal Exam.

Total Marks	=	100
Theory	=	50
Practical	=	50

For further examination the internal assessment marks should be calculated based on periodical tests in theory and practical at every term i.e. 4 tests for D. (Ortho)

Passing will be 50% of the marks in each head separately i.e. Theory, Practicaland internal examination. Total marks should be 50% of the total marks for passing

BOOKS RECOMMENDED:

REFERENCE BOOKS:

1) Hardikar's Orthopaedics Operations Text and Atlas by- Shrinivas S. Shintre, Sharad M. Hardikar, Vijay M. Panchandikar

NATIONAL MEDICAL COMMISSION
Postgraduate Medical Education Board

D 11011/1/22/AC/Guidelines/17 **Date: 29-08-2022**

National Medical Commission

GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR MS IN ORTHOPEDICS

GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR MS IN ORTHOPAEDICS

Preamble

Competency based training programme in Orthopaedics aims to create postgraduate student who, after undergoing the requisite training, should be able to serve the needs of the community and should be competent to solve the problems pertaining to the speciality of Orthopaedics and Trauma.

A postgraduate undergoing training MS in Orthopaedics should be trained to identify and recognize various congenital, developmental, inflammatory, infective, traumatic, metabolic, neuromuscular, degenerative and oncologic disorders of the musculoskeletal system. She/he should be able to provide competent professional services to trauma and orthopaedic patients at a primary/ secondary/tertiary healthcare centres. The PG should acquire knowledge, skill and attitude to provide healthcare and education to the patients and students.

National Medical Commission

The purpose of this document is to provide teachers and learners illustrative guidelines to achieve defined outcomes through learning and assessment. This document was prepared by subject-content specialists. The Expert Group of the NMC had attempted to render uniformity without compromise to the purpose and content of the document. Compromise in purity of syntax has been made in order to preserve the purpose and content. This has necessitated retention of "domains of learning" under the heading "competencies.

In order to achieve sustainable outcomes, certain competencies are essential to be achieved and assessed that will enable the qualified professional to perform the role in practice as an orthopaedic specialist. These roles would be to perform as a:

1. Clinical Expert
2. Professional
3. Scholar
4. Team Member

SUBJECT SPECIFIC OBJECTIVES

The goal of M.S. Orthopaedics is to produce a competent doctor who:

1. Is aware of contemporary advances & developments in medical sciences as related to Orthopaedics and Trauma.
2. Has acquired the competencies pertaining to the subject that are required to be practiced in the community and at all levels of health system.
3. Recognizes the health needs of the patient and family and carries out professional obligations in keeping with principles of the National Health Policy and professional ethics.
4. Is oriented to principles of research methodology.
5. Has acquired skills in educating medical and paramedical professionals.
6. Has acquired skills in effectively communicating with the person, family and the community.

There is need of competency based learning. Core competencies are the essential knowledge, values and skills vital to the successful performance of effective practice of Orthopaedic and Trauma care on patients. Competence-based training is distinctly different from traditional teaching process. Competence-based training focuses on learning by doing.

Competence in medicine has been defined as "the habitual and judicious use of communication, knowledge, technical skills, clinical reasoning, emotions, values, and reflection in daily practice for the benefit of the individuals and communities being served". Competence is not an achievement but rather a habit of lifelong learning.

Ideally, the assessment of competence (what the student or physician is able to do) should provide insight into actual performance (what he or she does habitually when not observed), as a well as the capacity to adapt to change, find and generate new knowledge, and improve overall performance. The specific learning objectives based on core competence are common to all specialities. As an example of designing learning objectives in the seven domains of core competence are described below:

1. Professionalism
2. Patient care
3. Medical Knowledge
4. Practice-based learning and improvement
5. Interpersonal and Communication skills
6. Systems-based practice
7. Academic skills

National Medical Commission

The **Goal** of the MS Orthopedics course is to train a doctor to become a competent teacher, surgeon and researcher in who has acquired competence / skills as given below:

1. Professionalism

1.1 Accepts personal responsibility for care of one's patients, consistent with good work ethics and empathy.

1.2 Demonstrates appropriate truthfulness and honesty with colleagues.

1.3 Recognizes personal beliefs, prejudices, and limitations. His / her personal beliefs and prejudices should not come in the way of providing service.

1.5 Respects patient confidentiality at all times in verbal and written communication with others.

2. Patient Care

2.1 History of and physical examination

2.1.1 Demonstrates ability to obtain a comprehensive and focused history of illness from patient/relatives.

2.1.2 Demonstrates ability to perform a comprehensive and problem-focused physical examination of the concerned human organ.

2.2 Information Management

2.2.1 Demonstrates mastery of the traditional organization of medical data in oral and written presentations.

2.2.2 Demonstrates use and interpretation of diagnostic procedures and data.

2.2.3 Demonstrate ability to use information to produce evidence for the diagnosis and treatment of relevant disease condition/s.

2.3 Procedural

2.3.1 Demonstrates mastery of adequate medical record keeping.

2.3.2 Demonstrates knowledge of accessing data and information systems.

2.3.3 Demonstrates the ability to perform a specific set of procedures identified by the faculty.

3. Medical Knowledge

3.1 Core Discipline

3.1.1 Competencies unique to the discipline,

3.1.2 Competencies derived from the clinical, pre-clinical and para-clinical disciplines.

3.2 Problem Solving

3.2.1 Demonstrates the ability to identify and find information relevant to a clinical problem, using consultation, texts, and the archival literature and electronic media.

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3.2.2 Demonstrates the ability to generate an initial list of differential diagnoses given a specific chief complaint and patient characteristics.

3.2.3 Demonstrates the ability to re-rank the differential diagnoses based on information gathered from the history, physical, and auxiliary studies (investigations).

3.2.4 Demonstrates the ability to explain a mechanism for each aspect of a patient's problem, including biological, behavioural, and social aspects.

3.2.5 Demonstrates the ability to evaluate scientific / clinical information and critically analyze conflicting data and hypotheses.

3.2.6 Demonstrates an ability to counsel a patient providing an option of treatment, conservative or operative.

4. Practice-Based Learning and Improvement

4.1 Physician Scholar

4.1.1 Demonstrates the ability to analyze the quality and implications of medical literature and apply new knowledge in the delivery of health care.

4.1.2 Demonstrates an interest and ability to identify future areas of inquiry in medical research.

4.1.3 Demonstrates enthusiasm and positive attitude in the educational process and participates fully in educational activities.

5. Interpersonal and Communication Skills

5.1 Human Relationships

5.1.1 Demonstrates knowledge of or appropriate inquiry about family and support systems.

5.1.2 Demonstrates an effective system for identifying and addressing ethical, cultural, and spiritual issues associated with health care delivery.

5.1.3 Demonstrates knowledge or applies an understanding of psychological, social, and economic factors which are pertinent to the delivery of health care.

5.1.4 Accurately assesses a patient's exportations and assumptions in accessing the health care system.

5.1.5 Effectively engages the patient and / or family in verbal communications and counselling.

6. System – Based Practice

6.1 Health Care Management

6.1.1 Demonstrates a practical, efficient and cost effective approach to diagnosis and treatment planning and recognizes its social and economic impact.

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6.1.2 Demonstrates the ability to engage the patient family in diagnosis and therapeutic treatment planning.

6.1.3 Demonstrates the ability to recognize and outline initial treatment for patient with life threatening emergencies regardless of aetiology.

6.1.4 Demonstrates knowledge of alternative medicine options and understands their role in health care delivery (AYUSH).

6.2 Health Service Delivery

6.2.1 Demonstrates knowledge of health care financing and applies it in assisting patient to access the best possible care.

6.2.2 Utilizes knowledge of population-based and evidence-based medicine in making patient management decisions.

6.2.3 Utilizes knowledge of managed care systems in making patient treatment plans and health care maintenance plans.

6.3 Health Care Team approach to health care delivery.

6.3.1 Demonstrates an understanding of the roles and competencies of other health care providers.

6.3.2 Demonstrates the ability to engage other health care professionals.

6.3.3 Demonstrates the ability to follow and lead in a team approach to health care delivery.

7. Academic Skills (Scholarly activity)

7.1 Familiarity with basic research methodology, epidemiology, basic information technology skills.

7.2 Planning the protocol of a thesis, its execution and final report.

7.3 Skills to review of relevant literature and asking relevant research question with hypothesis development.

7.4 Conducting clinical sessions for undergraduate medical students, nurses and paramedical workers.

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SUBJECT SPECIFIC COMPETENCIES

1. **Predominant in cognitive domain**:

1.1. Describe the principles of injury and its mechanism and mode, its clinical presentation, plan appropriate investigations and interpret the results, and institute the management of musculoskeletally injured patient, different forces resulting in fractures, biomechanical principles of fracture fixation.

1.2. Identify and describe the surface anatomy and relationship within of the various bones, joints, ligaments, major arteries, veins and nerves of the musculoskeletal system of the spine, upper limb, lower limb and the pelvis, chest, abdomen and head & neck. Identify structural peculiarities of specific bony components and structural speciality of clinical importance during fixation.

1.3. Define and describe the pathophysiology of shock (circulatory failure), types of shock and principles of management.

1.4. Define and describe, types of respiratory failure, the pathophysiology of respiratory failure and management.

1.5. Describe the principles and stages of bone and soft tissue healing, types of bone healing and different intrinsic and extrinsic factors which influence fracture healing.

1.6. Understand and describe the metabolic, nutritional, endocrine, and social impact of trauma, critical illness and biomechanical principles involved in each.

1.7. Enumerate, classify and describe the various bony/soft tissue injuries affecting the axial and appendicular skeletal system in adults and children.

1.8. Describe the principles of internal and external fixation for stabilization of bone and joint injuries.

1.9. Describe the mechanism of homeostasis, fibrinolysis and methods to control haemorrhage and rationale for each management.

1.10. Describe the physiological coagulation cascade and its abnormalities.

1.11. Describe different techniques of pain management as well as recovery of function in specific disease and trauma scenario.

1.12. Describe the pharmacokinetics and pharmacodynamics of drug metabolism and excretion of analgesics, anti-inflammatory agents, antibiotics, disease - modifying agents and chemotherapeutic agents and biologicals.

1.13. Understand the principles of Early Total Care and Damage Control Orthopaedics and planning of definitive orthopaedic management.

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1.14. Understand the principles of biostatistics and research methodology.

1.15. Understand the principles of Angiography, CT/MR angiography, Doppler Ultrasound, Sinogram.

1.16. Acquire the ability to order investigations.

2. Describe the clinical presentation, plan investigations, interpret results and institute steps for the management and prevention of the following disease conditions:
   2.1. Nutritional deficiency diseases affecting the bones and joints,
   2.2. Depositional arthropathies,
   2.3. Endocrine abnormalities of the musculoskeletal system,
   2.4. Metabolic abnormalities of the musculoskeletal system,
   2.5. Congenital anomalies of the musculoskeletal system,
   2.6. Developmental skeletal disorder of the musculoskeletal system,
   2.7. Bone and soft tissue tumours affecting the musculoskeletal system.

3. Describe the pathogenesis and clinical features of the following conditions in adults and children, plan appropriate investigations, interpret the results and institute appropriate management of:
   3.1. Tubercular infections of bone and joints (musculoskeletal system),
   3.2. Pyogenic infections of musculoskeletal system,
   3.3. Mycotic infections of musculoskeletal system,
   3.4. Autoimmune disorders of the musculoskeletal system (HIV),
   3.5. Rheumatoid arthropathy, Ankylosing spondylitis, seronegative arthropathy.
      3.5.1. Osteoarthrosis and spondylosis

4. Describe the pathogenesis and clinical presentation, plan and interpret results of investigations and institute appropriate treatment in the following conditions:
   4.1. Post-polio residual paralysis
   4.2. Cerebral palsy
   4.3. Muscular dystrophies and myopathies
   4.4. Nerve injuries
   4.5. Entrapment neuropathies
   4.6. Spinal dysraphism
   4.7. Spinal anomalies.

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5. Diagnose musculoskeletal manifestation of AIDS and HIV infection and its management.
6. Describe the aetiopathogenesis and clinical presentation, plan and interpret results of investigations and institute appropriate treatment for the management of osteonecrosis of bones.
7. Identify situations requiring rehabilitation services, prescribe suitable orthotic and prosthetic appliances and act as a member of the team providing rehabilitation care.
8. Identify and manage emergency situation in disorders of the musculoskeletal system.
9. Understand the basics of diagnostic imaging in orthopaedics like how and when to order and how to interpret the results of:
    9.1. Plain x-ray
    9.2. Ultrasonography
    9.3. Computerised axial tomography
    9.4. Magnetic resonance imaging
    9.5. PET scan
    9.6. Radio Isotope bone scan
    9.7. Digital Subtraction Angiography (DSA)
    9.8. Dual energy x-ray Absorptiometry
    9.9. Arthrography.
10. Describe the aetiopathogenesis, clinical presentation, identification, plan investigation/s and institute appropriate treatment for oncologic problems of musculoskeletal system (both benign and malignant: primary and secondary).
11. Understand the basics and principles of biomaterials and orthopaedic metallurgy.
12. Describe the principles of normal and abnormal gait and understand the biomedical principles of posture and replacement surgeries.
13. Describe social, economic, environmental, biological and emotional determinants of health in a given patient with a musculoskeletal problem.
14. Identify a research problem, prepare a research protocol, conduct a study, record observations, analyse data, interpret the results, discuss and disseminate the findings

II. Predominant in the Psychomotor domain

1. At the end of the first year of M.S. Orthopaedics programme, the student should be able to:

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1.1. Elicit a clinical history from a patient, do a physical examination, document in a case record, order appropriate investigations and make a clinical diagnosis. (Records of all competencies achieved should be documented in log book/E-Portfolio)

1.2. Impart wound care, where applicable, including different types of wound, and different chemotherapeutic agents for wound care, including VAC application and its care, and local antibiotic delivery system.

1.3. Apply all types of POP casts/slabs, splints and tractions as per need. Learn different types of bandaging.

1.4. Identify shock and provide resuscitation.

1.5. Perform aspiration of joints and local infiltration of appropriate drugs.

1.6. Perform appropriate wound debridement.

1.7. Perform arthrotomy of knee joint and also assist in arthrotomy of hip, anklet and shoulder.

1.8. Perform incision and drainage of abscess.

1.9. Perform split thickness skin grafting.

1.10. Perform fasciotomies.

1.11. Apply external fixators.

1.12. Apply skeletal tractions including skull tongs.

1.13. Triage a disaster situation and multiple trauma patients in an emergency room.

1.14. Perform on bone models, interfragmentary compression screws, external fixation, Tension band wiring and Broad plating.

1.15. Perform closed reduction of common dislocations like shoulder and common fractures like collar fracture, supracondylar fracture.

1.16. Perform on a cadaver standard surgical approaches to the musculo-skeletal system.

2. At the end of the second year of M.S. Orthopaedics course, the student should be able to:

2.1. Take an informed consent for standard orthopaedic procedures.

2.2. Perform closed/open biopsies for lesions of bone, joints and soft tissues.

2.3. Perform split thickness skin grafting and local flaps.

2.4. Perform on bone models, internal fixation with k-wires, screws, plates, Dynamic hip/condylar screws/nailing.

2.5. Perform sequestrectomy and saucerisation.

2.6. Perform arthrotomy of joints like hip/shoulder, ankle, elbow.

2.7. Perform repair of open hand injuries including tendon repair.

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2.8. Perform arthodesis of small joints.

2.9. Perform diagnostic arthroscopy on models and their patients.

2.10. Perform carpal tunnel/tarsal tunnel release.

2.11. Apply Ilizarov external fixator.

2.12. Perform soft tissue releases in contractures, tendon lengthening and correction of deformities.

2.13. Perform amputations at different levels.

2.14. Perform corrective surgeries for Congenital talipes equino-varus (CTEV), DDH, Perthes/ skeletal dysplasia.

2.15. Perform cadaver based procedures, arthroscopy, arthrotomy.

3. At the end of the third year of M.S. Orthopaedics programme, the student should be able to:

3.1. Assist in the surgical management of poly trauma patient.

3.2. Assist in Arthroplasty surgeries of hip, knee, shoulder and the ankle.

3.3. Assist in spinal decompressions and spinal stabilizations.

3.4. Assist in operative arthroscopy of various joints.

3.5. Assist /perform arthrodesis of major joints like hip, knee, shoulder, elbow.

3.6. Assist in corrective osteotomies around the hip, pelvis, knee, elbow, finger and toes.

3.7. Assist in surgical operations on benign and malignant musculoskeletal tumour including radical excision and custom prosthesis replacement.

3.8. Assist in open reduction and internal fixations of complex fractures of acetabulam, pelvis, IPSI lateral floating knee/elbow injuries, shoulder girdle and hand.

3.9. Assist in spinal deformity corrections.

3.10. Independently perform closed/open reduction and internal fixation with DCP, LCP, intra- medullary nailing, LRS.

3.11. Assist in limb lengthening procedures.

3.12. Assist in revision surgeries.

3.13. Provide pre- and post- OP care. This care should be exercised from first year.

3.14. Perform all clinical skills as related to the speciality.

III. Predominant in Affective Domain:

1. Should be able to function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the patient and the clinician or other colleagues to provide the best possible diagnosis or opinion.

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1.1. Always adopt ethical principles and maintain proper etiquette in dealings with patients, relatives and other health personnel and to respect the rights of the patient including the right to information and second opinion.

1.2. Develop communication skills to word reports and professional opinion as well as to interact with patients, relatives, peers and paramedical staff, and for effective teaching.

IV. Attitudes including Communication skills and Professionalism

1. Communication skills: The PG student should:

1.1. Exhibit participation in honest, accurate health related information sharing in a sensitive and suitable manner.

1.2. Recognize that being a good communicator is essential to practice effectively.

1.3. Exhibit effective and sensitive listening skills.

1.4. Recognise the importance and timing of breaking bad news and know how to communicate.

1.5. Exhibit participation in discussion of emotional issues.

1.6. Exhibit leadership in handling complex and advanced communication.

1.7. Recognize the importance of patient confidentiality and the conflict between confidentiality and disclosure.

1.8. Be able to establish rapport in therapeutic bonding with patients, relatives and other stakeholders through appropriate communication.

1.9. Able to obtain comprehensive and relevant history from patients/relatives.

1.10. Able to counsel patients on their condition and needs. Add counselling of diagnosis, prognosis, complications as well as planning for the management.

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2. **Team work**: Seek cooperation. Coordination and communication among treating specialties and paramedical staff.
3. **Counselling of relatives**: regarding patient's condition, seriousness, bereavement and counselling for organ donation in case of brain stem death.
4. **Leadership**: Trauma prevention, education of the public, paramedical and medical persons.
5. **Advocacy**: with the government and other agencies towards cause of trauma care.
6. **Ethics**: The Code of Medical Ethics as proposed by National Medical Commission of India will be learnt and observed.

SUBJECT SPECIFIC PRACTICE-BASED OR PRACTICAL COMPETENCIES

Name/ Description of practice based competencies	Expected quantum
1. Taking a Clinical History from a patient with appropriate physical exam a. Hip-pain, Limp, Deformity, Instability, Both in child and adult b. Knee-pain, Deformity, Instability in child and adult c. Ankle, Foot d. Shoulder e. Elbow f. Wrist g. Head h. Spine	At least 3 clinical encounters in each region
2. In the Bone Skills Lab **Basic** 1. Introduction and tension band wiring 2. Lag screw interfragmentary compression 3. Broad plating 4. Narrow plating 5. Ex-Fix 6. Cancellous screw fixation 7. Umex **Intermediary** 1. DHS 2. DCS 3. Tibia nailing 4. Femur nailing 5. Tibia condyle 6. Elbow 7. Ankle **Advanced:** 1. Pelvis 2. Pubic symphysis 3. Acetabulum 4. MIPPO 5. Hemiarthroplasty 6. Spine posterior 7. Spine anterior	Practice at least twice on bone models and record

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3. On Patients i. **At the end of the first year of M.S. Orthopaedics programme, the student will be able to perform:** a. Wound care - different types of wound, and different chemotherapeutic agents for wound care, including VAC application b. POP casts/slabs, splints and tractions as per need. Learning of different types of bandaging. c. Identify shock and provide resuscitation d. Aspiration of joints and infiltration of appropriate drugs e. wound debridement f. Arthrotomy of knee joint and assist in arthrotomy of Hip, anklet, shoulder. g. Incision and drainage of abscess h. Split thickness skin grafting i. Fasciotomes j. External fixators k. Skeletal tractions including skull tongs l. Triage a disaster situation and multiple trauma patients in an emergency room m. Perform on bone models, interfragmentary compression screws, external fixation, Tension band wiring and Broad plating n. Closed reduction of common dislocations like shoulder and common fractures like collar fracture, supracondylar fracture. o. Perform on a cadaver standard surgical approaches to the musculo skeletal system. **ii. At the end of the second year of M.S. Orthopaedics course, the student should be able to:** a. Perform closed/open biopsies for lesions of bone, joints and soft tissues b. Perform split thickness skin grafting and local flaps	As per the clinical volume available in each institution

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c. Perform on bone models, internal fixation with k-wires, screws, plates. Dynamic hip/condylar screws/nailing. d. Perform sequestrectomy and saucerisation e. Perform arthrotomy of joints like hip/shoulder, ankle, elbow f. Perform repair of open hand injuries including tendon repair g. Perform arthodesis of small joints h. Perform diagnostic arthroscopy on models and their patients i. Perform carpal tunnel/tarsal tunnel release j. Apply ilizarov external fixator k. Perform soft tissue releases in contractures, tendon lengthening and correction of deformities l. Perform amputations at different levels m. Perform corrective surgeries for CTEV, DDH, perthes/ skeletal dysplasia n. Perform cadaver based procedures, Arthroscopy, Arthrotomy.	As per the clinical volume available in each institution
iii. At the end of the third year of M.S. Orthopaedics programme, the student should be able to: a. Assist in the surgical management of poly trauma patient b. Assist in Arthroplasty surgeries of hip, knee, shoulder and the ankle c. Assist in spinal decompressions and spinal stabilizations d. Assist in operative arthroscopy of various joints e. Assist /perform arthrodesis of major joints like hip, knee, shoulder, elbow f. Assist in corrective osteotomies around the hip, pelvis, knee, elbow, finger and toes g. Assist in surgical operations on benign and malignant musculoskeletal tumour including radical excision and custom prosthesis replacement. h. Assist in open reduction and internal fixations of complex fractures of acetabulam, pelvis, IPSI lateral floating knee/elbow injuries, shoulder girdle and hand i. Assist in spinal deformity corrections	As per the clinical volume available in each institution

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j. Independently perform closed/open reduction and internal fixation with DCP, LCP, intra meduallary nailing, LRS k. Assist in limb lengthening procedures l. Assist in Revision surgeries m. Provide pre and post OP care This care should be exercised from first year n. Perform all clinical skills as related to the speciality.	

SYLLABUS

I. COGNITIVE DOMAIN

At the end of the M.S. Orthopaedics programme, the post graduate student should be competent and show sufficient understanding of Basic Sciences as applicable to Orthopaedics and Trauma through a problem based approach.

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1. Basic Sciences as related to Orthopaedics and Trauma

a) Embryogenesis of all organ systems
b) Structure and function of Central Nervous System
c) Structure and function of the peripheral Nervous System
d) Structure and function of the arterial and venous system
e) Structure and functions of the head & neck, abdomen, thorax and extremities.

2. Physiological basis and Pathophysiology in Health and Disease

a) Physical Growth
b) Temperature regulation
c) Acid Base Balance
d) Fluid Balance
e) Hematopoiesis
f) Hemostasis
g) Electrolyte balance
h) Bone mineralization: Calcium-Phosphate balance
i) Renal functions

j) Hepatic function
k) Respiratory functions
l) Cardiac functions
m) Gastrointestinal functions
n) Endocrine functions
o) Developmental Milestones
p) Nutritional Needs of Orthopaedic/Trauma Patients
q) Allergy

3. **Clinical Microbiology as related to Orthopaedic infections**
   a) Virology
   b) Bacteriology
   c) Mycology
   d) Parasitology (Protozoology and Helminthology)
   e) Waste disposal, Sterilization, Disinfection

4. Clinical Pharmacology as related to Orthopaedics & Trauma
   a) Pharmacokinetics – of common medications used in Orthopaedics & Trauma
   b) Antimicrobials
   c) Analgesia, Sedation
   d) Drug Interactions
   e) Adverse effects
   f) Antidotes for Poisons
   g) Drug induced disease

5. **Professionalism and Ethics**
   a) Professionalism
   b) Ethics
   c) Medico legal essentials

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6. **Wound healing principles**
    a) Types of wounds
    b) Stages of wound healing
    c) Biochemical & Molecular factors in wound healing
    d) Chemotherapeutic and other Pharmaceuticals in wound care
    e) Host, Environment and agent factors
7. **Bone Healing**
    a) Principles of bone healing
    b) Biological bone healing
    c) Factors influencing bone healing
    d) Biomechanism of bone healing

TEACHING AND LEARNING METHODS

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General principles

Acquisition of competencies being the keystone of doctoral medical education, such training should be skills oriented. Learning in the program, essentially autonomous and self-directed, and emanating from academic and clinical work, shall also include assisted learning. The formal sessions are meant to supplement this core effort.

All students joining the postgraduate (PG) courses shall work as full-time (junior) residents during the period of training, attending not less than 80% of the training activity during the calendar year, and participating in all assignments and facets of the educational process. They shall maintain a log book for recording the training they have undergone, and details of the procedures done during laboratory and clinical postings in real time.

Teaching-Learning methods

This should include a judicious mix of demonstrations, symposia, journal clubs, clinical meetings, seminars, small group discussion, bed-side teaching, case-based learning, simulation-based teaching, self-directed learning, integrated learning, interdepartmental meetings and any other collaborative activity with the allied departments. Methods with exposure to the applied aspects of the subject relevant to basic/clinical sciences should also be used. **The suggested examples of teaching-learning methods are given below but are not limited to these. The frequency of various below mentioned teaching-learning methods**

can vary based on the subject's requirements, competencies, work load and overall working schedule in the concerned subject.

A. Lectures: Didactic lectures should be used sparingly. A minimum of 10 lectures per year in the concerned PG department is suggested. Topics to be selected would be as per subject requirements. All postgraduate trainees will be required to attend these lectures. Lectures can cover topics such as:

1. Subject related important topics as per specialty requirement
2. Recent advances
3. Research methodology and biostatistics
4. **Salient features of Undergraduate/Postgraduate medical curriculum**
5. Teaching and assessment methodology.

Topic numbers 3, 4, 5 can be done during research methodology/biostatistics and medical education workshops in the institute.

B 1. Journal club: Minimum of twice a month is suggested.

Topics will include presentation and critical appraisal of original research papers published in peer reviewed indexed journals. The presenter(s) shall be assessed by faculty and grades recorded in the logbook.

B 2. ORTHO RADIOLOGY MEETS: Twice a month discussions amongst Ortho & Radiology Residents under facilitation of faculty on various imaging modalities used and its interpretation.

B.3. ORTHO SURGICAL PATHOLOGICAL MEET: Special emphasis on the surgical pathology radiological aspect of the case in the pathology department. Clinician (Ortho resident) presents the clinical details of the case, radiology PG student describes the Radiological findings and its interpretation and Pathology student describes the morbid anatomy and histopathology of the same case.

B. 4. SKILLS LAB SESSIONS: Once a fortnight for first 2 years.

C. Student Seminar: Minimum of twice a month is suggested.

Important topics should be selected as per subject requirements and allotted for in-depth study by a postgraduate student. A teacher should be allocated for each seminar as faculty moderator to help the student prepare the topic well. It should aim at comprehensive evidence-based review of the topic. The student should be graded by the faculty and peers.

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D. Student Symposium: Minimum of once every 3 months.

A broad topic of significance should be selected, and each part shall be dealt by one postgraduate student. A teacher moderator should be allocated for each symposium and moderator should track the growth of students. The symposium should aim at an evidence-based exhaustive review of the topic. All participating postgraduates should be graded by the faculty and peers.

E. Laboratory work / Bedside clinics/case presentation: Case presentation once a week in the ward, outpatient department/special clinics.

Laboratory work/Clinics/bedside teaching should be coordinated and guided by faculty from the department. Various methods like DOAP (Demonstrate, Observe, Assist, Perform), simulations in skill lab, and case-based discussions etc. are to be used. Faculty from the department should participate in moderating the teaching-learning sessions during clinical rounds.

F. Interdepartmental colloquium

Faculty and students must attend monthly meetings between the main Department and other department/s on topics of current/common interest or clinical cases; eg., combined clinical round with Radiology, Pathology etc.

G. a. Rotational clinical / community / institutional postings

Depending on local institutional policy and the subject specialty needs, postgraduate trainees may be posted in relevant departments/ units/ institutions. The aim would be to acquire more in-depth knowledge as applicable to the concerned specialty. Postings would be rotated between various units/departments and details to be included in the specialty-based Guidelines. Few examples are listed below:

1. Clinical postings

A major portion of posting should be in Orthopaedics department. It should include in-patients, out-patients, ICU, trauma, emergency room and speciality clinics.

Rotation of posting

- Inter-unit rotation in the department should be done for a period of up to one year.
- Rotation in appropriate related subspecialties for a total period not exceeding 06 months.

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- Medical Education Unit (MEU) or Department of Medical Education (DOME) (optional)

T/L Education

- Bone Skills Lab sessions – Twice a week
- Surgical Audit sessions – Once every week
- Cadaver based education – Twice a month
- Web based e-learning sessions – Once a fortnight
- Simulated environment learning – Two sessions in a week
- **Mortality & Morbidity meetings with SURGICAL AUDIT:** Once a month

G b. Posting under "District Residency Programme" (DRP):

All postgraduate students pursuing MS/MS in broad specialities in all Medical Colleges/Institutions shall undergo a compulsory rotation of three months in District Hospitals/District Health System as a part of the course curriculum, as per the Postgraduate Medical Education (Amendment) Regulations (2020). Such rotation shall take place in the 3rd or 4th or 5th semester of the Postgraduate programme and the rotation shall be termed as "District Residency Programme" and the PG medical student undergoing training shall be termed as "District Resident".

Every posting should have its defined learning objectives. It is recommended that the departments draw up objectives and guidelines for every posting offered in conjunction with the collaborating department/s or unit/s. This will ensure that students acquire expected competencies and are not considered as an additional helping hand for the department / unit in which they are posted. The PG student must be tagged along with those of other relevant departments for bedside case discussion/basic science exercises as needed, under the guidance of an assigned faculty.

Opportunities to present and discuss infectious disease cases through bedside discussion and ward/grand rounds with specialists / clinicians in different hospital settings must be scheduled to address antimicrobial resistance issues and strategies to deal with it.

H. Teaching research skills

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Writing a thesis should be used for inculcating research knowledge and skills. All postgraduate students shall conduct a research project of sufficient depth to be presented to the University as a postgraduate thesis under the supervision of an eligible faculty member of the department as guide and one or more co-guides who may be from the same or other departments.

In addition to the thesis project, every postgraduate trainee shall participate in at least one additional research project that may be started or already ongoing in the department. It is preferable that this project will be in an area different from the thesis work. For instance, if a clinical research project is taken up as thesis work, the additional project may deal with community/field/laboratory work. Diversity of knowledge and skills can thereby be reinforced.

I. Training in teaching skills

MEU/DOME should train PG students in education methodologies and assessment techniques. The PG students shall conduct UG classes in various courses and a faculty shall observe and provide feedback on the teaching skills of the student.

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J. Log book

During the training period, the postgraduate student should maintain a Log Book indicating the duration of the postings/work done in Wards, OPDs, Casualty and other areas of posting. This should indicate the procedures assisted and performed and the teaching sessions attended. The log book entries must be done in real time. The log book is thus a record of various activities by the student like: (1) Overall participation & performance, (2) attendance, (3) participation in sessions, (4) record of completion of pre-determined activities, and (5) acquisition of selected competencies.

The purpose of the Log Book is to:

a) help maintain a record of the work done during training,
b) enable Faculty/Consultants to have direct information about the work done and intervene, if necessary,
c) provide feedback and assess the progress of learning with experience gained periodically.

The Log Book should be used in the internal assessment of the student, should be checked and assessed periodically by the faculty members imparting the training. The PG students will be required to produce completed log book in original at the time of final practical examination. It should be signed by the Head of the Department. A proficiency certificate from the Head of Department regarding the clinical competence and skillful performance of procedures by the student will be submitted by the PG student at the time of the examination.

The PG students shall be trained to reflect and record their reflections in log book particularly of the critical incidents. Components of good teaching practices must be assessed in all academic activity conducted by the PG student and at least two sessions dedicated for assessment of teaching skills must be conducted every year of the PG program. The teaching faculty are referred to the MCI Logbook Guidelines uploaded on the Website.

K. **Course in Research Methodology**: All postgraduate students shall complete an online course in Research Methodology within six months of the commencement of the batch and generate the online certificate on successful completion of the course.

Other aspects

- The Postgraduate trainees must participate in the teaching and training program of undergraduate students and interns attending the department.
- Trainees shall attend accredited scientific meetings (CME, symposia, and conferences) at least once a year.
- Department shall encourage e-learning activities.
- The Postgraduate trainees should undergo training in Basic Cardiac Life Support (BCLS) and Advanced Cardiac Life Support (ACLS).
- The Postgraduate trainees must undergo training in information technology and use of computers.

During the training program, patient safety is of paramount importance; therefore, relevant clinical skills are to be learnt initially on the models, later to be performed under supervision followed by independent performance. For this purpose, provision of skills laboratories in medical colleges is mandatory.

ASSESSMENT

FORMATIVE ASSESSMENT, ie., assessment to improve learning

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Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self-directed learning and ability to practice in the system.

General Principles

Internal Assessment should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills.

The Internal Assessment should be conducted in theory and practical/clinical examination, should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills.

Quarterly assessment during the MS training should be based on:

1. Journal based / recent advances learning
2. Patient based /Laboratory or Skill based learning
3. Self-directed learning and teaching
4. Departmental and interdepartmental learning activity
5. External and Outreach Activities / CMEs
6. Mini Cex encounter – at least 4
7. Clinical encounter cards - at least -4
8. Direct observation of procedural skills – at least 6 including Cadaver dissection
9. OSCE/Theory, Essay, Short notes
10. MCQS
11. Bone Skill Lab performance assessment

Note: These sessions may be organized and recorded as an institutional activity for all postgraduates.

- Attendance at Scientific meetings, CME programmes (at least 02 each)

The student to be assessed periodically as per categories listed in the student appraisal form (Annexure I).

SUMMATIVE ASSESSMENT, ie., assessment at the end of training

Essential pre-requisites for appearing for examination include:

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1. **Log book** of work done during the training period including rotation postings, departmental presentations, and internal assessment reports should be submitted.

2. At least **two presentations** at national level conference. One research paper should be published / accepted in an indexed journal**. (It is suggested that the local or University Review committee assess the work sent for publication).**

The summative examination would be carried out as per the Rules given in the latest POSTGRADUATE MEDICAL EDUCATION REGULATIONS. The theory examination shall be held in advance before the Clinical and Practical examination, so that the answer books can be assessed and evaluated before the commencement of the clinical/Practical and Oral examination**.**

The postgraduate examination shall be in three parts**:**

1. **Thesis**

   Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination. The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination. A post graduate student in broad specialty shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners**.**

2. **Theory examination**

   The examinations shall be organized on the basis of 'Grading'or 'Marking system' to evaluate and to certify post graduate student's level of knowledge, skill and competence at the end of the training, as given in the latest POSTGRADUATE MEDICAL EDUCATION REGULATIONS. Obtaining a minimum of 50% marks in 'Theory' as well as 'Practical' separately shall be mandatory for passing examination as a whole. The examination for M.D./ M.S shall be held at the end of 3rd academic year.

   There shall be four theory papers (as per PG Regulations).

   Paper I: Basic sciences as applied to the subject

   Paper II: Traumatology and Rehabilitation

   Paper III: Orthopaedic diseases

   Paper IV: Recent advances in Orthopaedic surgery & General Surgery as applied to Orhopaedics

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3. Practical/clinical and Oral/viva voce examination

Practical examination

Practical examination should be spread over **two** days and include various major components of the syllabus focusing mainly on the psychomotor domain.

Oral/Viva voce examination on defined areas should be conducted by each examiner separately. Oral examination shall be comprehensive enough to test the post graduate student's overall knowledge of the subject focusing on psychomotor and affective domain. It should include:

- Stations for clinical, procedural and communication skills
- Log Book Records and reports of day-to-day observation during the training
- Should test the post graduate student's overall knowledge of the subject in:
    - Ortho Radiology
    - Ortho Pathology
    - Histopathology & Gross anatomy
    - Instruments
    - Orthotics and Prosthotics

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Recommended Reading:

1. Campbell's Operative Orthopaedics, Vols 1, 2, 3 & 4 Campbell's Operative Orthopaedics, 4-Volume Set, 14th Edition by Frederick M Azar, MD, S. Terry Canale, MD and James H. Beaty, MD
2. Mercer's Orthopaedic Surgery Vol. 1 & 2, Author(s) : Robert B Duthie Edition: Nineth, Year of Publication: 2003
3. Rockwood And Greens – Fractures in Adults, Vol 1& 2 Rockwood and Green's Fractures in Adults Author(s): Paul Tornetta , William Ricci MD, FAAOS, Charles M. Court-Brown MD, FRCS Ed (Orth), Margaret M. McQueen MD, Michael McKee MD, FRCS (C)Publication Date: March 27, 2019
4. Fractures in Children – Rockwood & Wilkins - Rockwood and Wilkins Fractures in Children Edition: 9. Author(s): Peter M Waters MD, David L. Skaggs MD, John M. Flynn. Publication Date: March 19, 2019

5. Paediatric Orthopaedics – Tachidjian, Vol 4 Tachdjian's Pediatric Orthopaedics: From the Texas Scottish Rite Hospital for Children, 6th edition - November 27, 2020 Author: John Herring
6. Concise System Of Orthopaedics And Fractures – Graham Apley Apley's Concise System of Orthopaedics and Fractures Louis Solomon, David Warwick, Selvadurai Nayagam CRC Press, 31-Mar-2005
7. Textbook of Orthopaedics and Trauma – Kulkarni, Vol 1 Textbook of Orthopedics and Trauma (4 Volumes) GS Kulkarni, Sushrut Babhulkar, Publish Year 2016
8. B.D. Chaurasia's Human Anatomy, Vol1,Vol 2, Vol 3 B D Chaurasia's Handbook of Anatomy English Editions 2022 Eighth Editions Volume 2 (paperpack, CHAURASIAS), Author: CHAURASIAS, Publisher: CBS Publishers, Publishing Date 2022
9. Pharmacology and Pharmacotherapeutics – Satoskar- Pharmacology and Pharmacotherapeutics, 24th Edition - June 30, 2015, Authors: RS Satoskar, Nirmala Rege, SD Bhandarkar
10. Orthopaedics Anatomy and Surgical Approaches Frederick Wreckling Orthopaedic Anatomy and Surgical Approaches Edited by Frederick W. Reckling, Jo Anne B. Reckling and Melvyn P. Mohn, S. P. Frostick, First Published August 1, 1991
11. Green's Operative Hand Surgery-Vol. 1&. 2, Green, David P; Hotchkiss, Robert N Green's Operative Hand Surgery, 2-Volume Set 7th Edition - February 24, 2016, Authors: Scott W. Wolfe, William C. Pederson, Scott H. Kozin, Mark S. Cohen
12. Surgical Exposures in Orthopedics: The Anatomic Approach, Hoppenfeld, Stanley; De Boer, Piet Surgical Exposures in Orthopaedics: The Anatomic Approach, Edition: 6, Author(s): Piet de Boer MD, Richard Buckley MD, FRCSC, Stanley Hoppenfeld MD, Publication Date: October 7, 2021
13. Text Book of Ilizarov Surgical Techniques Bone Correction And Lengthening, Golyakhovsky, Vladimir; Frankel, Victor H Textbook of Ilizarov Surgical Techniques: Bone Correction and Lengthening by Vladimir Golyakhovsky, Victor H Frankel, Publishing Year 2010
14. Applied Orthopaedic Biomechanics, Dutta, Santosh; Datta, Debasis Applied Orthopaedic Biomechanics, by Debasis Datta Santosh K Dutta Publisher : B.I.Publications, Year 2008.

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Journals

03-05 international Journals and 02 national (all indexed) journals.

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Annexure 1

Student appraisal form for MS in Orthopedics											
	Element	**Less than Satisfactory**			**Satisfactory**			**More than satisfactory**			**Comments**
		1	2	3	4	5	6	7	8	9	
1	**Scholastic Aptitude and Learning**										
1.1	Has Knowledge appropriate for level of training										
1.2	Participation and contribution to learning activity (e.g., Journal Club, Seminars, CME etc.)										
1.3	Conduct of research and other scholarly activity assigned (e.g Posters, publications etc.)										
1.4	Documentation of acquisition of competence (eg. Log book)										
1.5	Performance in work based assessments										
1.6	Self- directed Learning										
2	**Care of the patient**										
2.1	Ability to provide patient care appropriate to level of training										
2.2	Ability to work with other members of the health care team										
2.3	Ability to communicate appropriately and empathetically with patients families and care givers										
2.4	Ability to do procedures appropriate for the level of training and assigned role										

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2.5	Ability to record and document work accurately and appropriate for level of training										
2.6	Participation and contribution to health care quality improvement										
3	**Professional attributes**										
3.1	Responsibility and accountability										
3.2	Contribution to growth of learning of the team										
3.3	Conduct that is ethical appropriate and respectful at all times										
4	**Space for additional comments**										
5	**Disposition**										
	Has this assessment been discussed with the trainee?	Yes	No								
	If not explain										
	Name and Signature of the assesse										
	Name and Signature of the assessor										
	Date										

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Subject Expert Group members for preparation of REVISED Guidelines for competency based postgraduate training programme for MS in Orthopaedics

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2. **Dr. Vinoo M. Cherian**
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3. **Dr. Vinod Kumar**
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GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR MS IN OTORHINOLARYGOLOGY

Preamble:

The purpose of PG education is to create specialists who would provide high quality health care and advance the cause of science through research & training.

The purpose of MS ENT is to standardize Otorhinolaryngology teaching at Post Graduate level throughout the country so that it will benefit in achieving uniformity in undergraduate teaching as well and resultantly creating competent ENT Surgeons with appropriate expertise.

The purpose of this document is to provide teachers and learners illustrative guidelines to achieve defined outcomes through learning and assessment. This document was prepared by various subject-content specialists. The Reconciliation Board of Academic Committee has attempted to render uniformity without compromise to purpose and content of the document. Compromise in purity of syntax has been made in order to preserve the purpose and content. This has necessitated retention of “domains of learning” under the heading “competencies”.

SUBJECT SPECIFIC LEARNING OBJECTIVES

At the end of postgraduate training the student should be able to:

1. Practice his specialty ethically keeping in mind the requirement of the patient, community and people at large.
2. Demonstrate sufficient understanding of basic sciences related to his specialty and be able to integrate such knowledge in his Clinical practice.
3. Diagnose and manage majority of conditions in his specialty (clinically and with the help of relevant investigations)
4. Plan and advise measures for the promotive, preventive, curative and rehabilitative aspects of health and diseases in the specialty of ENT.
5. Should be able to demonstrate his cognitive skills in the field of ENT and its ancillary branches during the formative and summative evaluation processes.
6. Play the assigned role in the implementation of National Health Programs
7. Demonstrate competence in basic concepts of research methodology and writing thesis and research papers.
8. Develop good learning, communication and teaching skills.

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9. Demonstrate sufficient understanding of basic sciences and the clinical applications related to the specialty to be able to integrate this knowledge into Clinical practice. Acquire in-depth knowledge in the subject including recent advances.
10. Demonstrate that he is fully conversant with the latest diagnostics & therapeutics available.

SUBJECT SPECIFIC LEARNING OBJECTIVES

1. Theoretical Knowledge:

A student should have fair knowledge of basic sciences (Anatomy, Physiology, Biochemistry, Microbiology, Pathology and Pharmacology) as applied to ENT and be able to integrate such knowledge in his clinical practice. She/He should acquire in-depth knowledge of his subject including recent advances. She/He should be fully conversant with the bedside procedures (diagnostic and therapeutic) and having knowledge of latest diagnostics and therapeutics available.

2. Clinical / Practical skills:

A student should be adept at good history taking, physical examination, providing basic life support and advanced cardiac life support, common procedures like FNAC, Biopsy, aspiration from serous cavities, lumber puncture etc. She/he should be able to choose the required investigations to enhance the attitude, communication skills, including dealing with patient's relatives with the required empathy, adapt to changing trends in education, learning methods and evolving new diagnostic and therapeutic techniques in the subject of ENT.

3. Research:

She/He should know the basic concepts of research methodology, plan a research project, plan and write a thesis and should know how to use library facilities. Basic knowledge of statistics is also required. Knowledge about use of internet resources is required.

4. Teaching:

The student should learn the basic methodology of teaching and assessment and develop competence in teaching medical/paramedical students and their assessment.

SUBJECT SPECIFIC COMPETENCIES

A. Cognitive Domain

At the end of training, the student should be able to demonstrate ability to practically apply knowledge gained during training period. This would include the following:

Basic Sciences related to Otolaryngology

- Physiology- Mechanism of perception of smell and taste, mechanism of breathing and voice production, lacrimation, deglutition and salivation. Functional tests of the nose and paranasal sinuses, mechanism of cough and sneezing.
- Physics of sound, theories of hearing, mechanism of perception of sound and speech production, physiology of equilibrium and cerebral function. Physiology of brain in connection with hearing, speech, smell and phonation. Audiologic tests like audiometry, impedance, evoked potentials, OAE, Speech audiometry.
- Physiology of larynx, tracheobronchial tree and oesophagus - Histology of mucous membranes, internal ear and other associated organs and structures, nose, PNS NPx, Larynx, Tracheo-Bronchial tree, Lymphoepithetical system. Mechanism of immune system/immunology and genetics.
- Anatomy-Embryogenesis of ear, nose and throat including palate and the larynx, Oesophagus, trachea and lungs, tongue, salivary gland Head and Neck and skull base etc.
- Parapharyngeal spaces in the neck including connective tissue barriers of larynx.
- Applied anatomy of the skull bones, accessory sinuses, external, middle and inner ears, nose, PNS, nasopharynx, meninges, brain, pharynx, larynx, trachea and bronchi, lungs, pleurae, oesophagus and the mediastinum.
- Anatomy of all cranial nerves with their functions.

Principles and Practices of Otolaryngology, Audiology and Speech Pathology

- Clinical Methodology as applied to ORL HN diseases in adult and children and the accessory sinuses, diagnosis and surgical treatment of diseases of nose, throat and ear in adult and children. Prevention and treatment, infectious diseases of Otolaryngology and Head Neck region. Circulatory and nervous disturbances of the nose, throat and ear and their effects on other organs of the body. Deformities, injuries sinus infections, polyps and the tumors of the nose, and paranasal sinuses.
- Examination of the ear, deafness and allied diseases, complications of diseases of the ear. Injuries, tumors, nervous and circulatory neurological disturbances of the ear. Diagnosis and treatment of tinnitus and vertigo. Diagnosis and rehabilitation of the Hearing handicapped including, dispensing of hearing aid other vibrotatile aids.
    - Surgical pathology of Otolaryngology and Head Neck region.
    - Basic knowledge of anaesthesia as related to ENT.
    - Examination of diseases of children (Paediatric ORL) in connection with throat and larynx. Neurological and vascular disturbances. Congenital and neonatal stridor.
    - Pathology of various diseases of the larynx and throat, tracheo-bronchial tree and their causative organisms.

- Indications and various techniques of direct laryngoscopy, nasal endoscopy. Bronchoscopy and oesophagoscopy, including microlaryngoscopic procedures.
- Reading of radiograms, scans, audiograms, nystagmograms and tympanograms in connection with ENT diseases/disorders.
- Special apparatus for the diagnosis and treatment of the diseases of ear, nose and throat including audiometer, BERA, Speech analyser etc.

Recent advances in Otolaryngology and Head Neck surgery

- Recent developments in the diagnosis, pathogenesis and treatment of the ENT diseases
- The knowledge of the frontiers of the oto-laryngology and lateral skull base surgery
- Rhinoplasty, endoscopic sinus surgery, and anterior cranial fossa surgery
- Knowledge of LASERS and fibre optics
- Other methods of managing Hearing loss
- Implantable hearing aids cochlear implants
- Phonosurgery
- Etiology and Managements of sleep apnoea/snoring
- Hypophysectomy and optic nerve decompressions
- Immunotherapy and modalities of the gene therapy
- Newer techniques for Radiotherapy including, use of gamma knife for treatment of Intracranial tumors and other malignancy
- Chemotherapy of cancer

General Surgical Principles and Head-Neck Surgery

- General Surgery, Head and Neck oncology, and Medicine as applicable to the ENT disorders/diseases. Surgery of congenital deformities of nose, ear (Pinna) and trachea/oesophagus etc.
- Radiology, Imaging – computed tomography and magnetic resonance imaging, (MRI) and intervention radiology and angiography as related to ENT
- General Pathologic aspects such as wound healing and also pathology and Pathogenesis of ENT diseases, Pharmacology, molecular biology, genetics, cytology, haematology, and immunology as applicable to otolaryngology
- General Principles of faciomaxillary traumatology and neck injury
- Plastic Surgery as applicable to Otolaryngology

B. Affective Domain

1. The student will show integrity, accountability, respect, compassion and dedicated patient care. The student will demonstrate a commitment to excellence and continuous professional development.
2. The student should demonstrate a commitment to ethical principles relating to providing patient care, confidentiality of patient information and informed consent.
3. The student should show sensitivity and responsiveness to patients' culture, age, gender and disabilities.
4. The student should be able to choose the required investigations to enhance the attitude, communicative skills, including dealing with patient's relatives with the required empathy, adapt to changing trends in education, learning methods and evolving new diagnostic and therapeutic techniques in the subject of ENT.

C. Psychomotor Domain

By the end of the training, a student should be able to demonstrate his skills in:

- Taking a good history and demonstrating good examination techniques.
- arrive at a logical working diagnosis, differential diagnosis after clinical examination and order appropriate investigations keeping in mind their relevance (need based) and thereby provide appropriate care that is ethical, compassionate, responsive and cost effective and in conformation with statutory rules.
- Should be able to perform and demonstrate the practical skills in the field of ENT including the following:
    - Examination of the ear, nose and throat oral cavity examination
    - Clinico-physiological examination and evaluation of the audio-vestibulo neurological system
    - Examination of the larynx and the throat including flexible endoscopy, stroboscopy, voice analysis and the clinico-physiological examination of the speech
    - Examination of the otological and audiological system including Tuning fork testing, audiological evaluation, micro and otoendoscopy
    - Clinical and physiological evaluation of the nose and paranasal sinuses including nasal endoscopy and olfactory evaluation
    - Examination of the neck and its structures
- Should demonstrate and perform various therapeutic skills related to the speciality such as :
    - Tracheostomy
    - Anterior/ posterior nasal packing
    - Ear Packing and Syringing
    - Foreign body removal from air nose and throat

- Airway management including basic life support skills, Cardiopulmonary resuscitation, intubation, homeostasis maintenance, IV alimentation and fluid, electrolyte maintenance and principles of blood transfusion alimentation including Nasogastric feeding, gastrostomy
- Wound suturing, dressings and care of the wounds
- Basic principles of rehabilitation
- common procedures like FNAC, biopsy, aspiration from serous cavities, lumber puncture etc.

- Should understand principles of and interpret X-rays/CT/MRI, audiograms, ENG, BERA, OAE, ultrasonographic abnormalities and other diagnostic procedures in relation to the speciality
- Should have observed/performed under supervision the various surgical procedures in relation to the speciality

Syllabus

Course contents:

1. Anatomy and Physiology of Ear, Nose and Throat, Trachea and esophagus.
2. The generation and reception of speech
3. Radiographic anatomy of the ear, nose, throat and imaging.
4. Bacteriology in relation to Otorhinolaryngology
5. Allergy and rhinitis
6. Haematology in relation to Otolaryngology
7. Anaesthesia for Otolaryngology
8. Pharmacology of drugs used in ENT
9. Electrolyte, fluid balance/shock conditions
10. Use of teaching aids
11. Routine blood, urine testing
12. Preparation of slides
13. Facial nerve stimulation test
14. Audiometric tests like pure tone Audiometry, Impedance Audiometry, Free field Audiometry, Specialized tests of hearing including SISI, Tone decay, ABLB, Speech discrimination score etc.
15. Vestibular tests like caloric testing (Water and Air) stopping test, Fukuda's test,
16. Evoked response audiometry.

Ear:

1. The physical and functional examination of the ear
2. The functional and physical examination of the vestibular system.
3. Tinnitus
4. Affections of external ear
5. Repair of deformities of the external ear.

6. Congenital conditions of the middle ear cleft
7. Traumatic conductive deafness
8. Acute inflammation of the middle ear cleft
9. Non-suppurative otitis media
10. Chronic suppurative otitis media
11. Management of chronic suppurative otitis media
12. Complications of infections of middle ear.
13. Tumors of the middle ear cleft and temporal bone
14. Diseases of the otic capsule-otosclerosis
15. Diseases of the otic capsule-other diseases
16. The deaf child
17. Acoustic neuroma
18. Ototoxicity
19. Presbycusis
20. Diagnosis and management of sudden and fluctuant sensorineural hearing loss
21. Meniere's disease
22. Neurologic aspects of vertigo
23. Facial paralysis
24. Rehabilitation of adults with acquired Hearing loss-Hearing aids
25. The cochlear Implants
26. Nystagmus
27. Otoacoustic emissions

Nose:

1. Examination of the nose
2. Conditions of the external nose
3. Injuries of the facial skeleton
4. Congenital diseases of the nose
5. The nasal septum
6. Foreign bodies in the nose, rhinolith
7. Epistaxis
8. Acute chronic inflammations of the nasal cavities
9. Vasomotor rhinitis-allergic and non-allergic
10. Nasal polyposis
11. Abnormalities of smell
12. Acute sinusitis
13. Chronic sinusitis
14. Nasal Allergy/Fungal allergic sinusitis
15. Complications of acute and chronic sinusitis
16. Tumors of nose and sinuses
17. Facial pains
18. Trans-ethmoidal hypophysectomy

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19. Functional endoscopic sinus surgery (FESS)

Throat:

1. Methods of examination of the mouth and pharynx
2. Diseases of the mouth
3. Diseases of the salivary glands
4. Pharyngeal lesions associated with general diseases
5. Diseases of the tonsils and adenoids (excluding neoplasms)
6. Tumors of the pharynx
7. Hypopharyngeal diverticulum (Pharyngeal Pouch)
8. Methods of examining and larynx and tracheobronchial tree
9. Congenital diseases of the larynx
10. Laryngeal disorders in singers and other voice users
11. Neurological affections of larynx and pharynx
12. Intubation of the larynx, laryngotomy and tracheostomy
13. Cervical node dissection
14. Skin grafts in Otolaryngology and reconstructive methods including regional and distant flaps for repair of defects after excision of tumors or trauma.
15. Micro laryngeal surgery/thyroplasty

Miscellaneous and head and neck:

1. Cranial nerves
2. Raised intracranial tension-causes, diagnosis, management with particular reference to otitis hydrocephalus
3. Head injuries and I.C. Haemorrhage
4. Pituitary gland, anatomy, physiology hypo - and hyper - pituitarism, new growths.
5. Intracranial venous sinuses and their affections
5. Osteology: skull, mandible cervical and thoracic vertebral sternum
6. Cervical fascia, facial spaces in neck, retro-pharyngeal and parapharyngeal Abscesses
7. Anatomy and physiology of thyroid gland, goitre, diseases of the thyroid and carcinoma of thyroid
8. Large blood vessels in neck, thoracic duck development of major cervical and thoracic blood vessels.
9. Head and neck reconstructive surgery

Drugs used in ENT:

1. Antibiotics Antihistaminic
2. Nasal vasoconstrictors
3. Local anaesthetics
4. Corticosteroids

5. Cyto-toxic agents
6. Antibiotics
7. Radioactive isotopes
8. Antifungal agents
9. Vasopressive and other agents used in shock like states.

General:

1. Physiology of circulation, regulation of blood pressure, reactions of body to haemorrhage, patho-physiology of shock, fluid balance, blood transfusion and its hazards, fluid replacement therapy, burns
2. Agents used in shock like states

Desirable

1. The ears and nasal sinuses in the aerospace environment
2. Physiological consideration of pressure effects on the ear and sinuses in deep water diving
3. The principles of cancer immunology with particular reference to head and neck cancer
4. Principles of chemotherapy in head and neck cancer
5. Recording of nystagmus by ENG and its interpretation

Ear:

1. Traumatic lesions of the inner ear
2. Inflammatory lesions of the vestibular and auditory nerve
3. Vascular lesions of the inner ear
4. Electronystagmography
5. Skull base/Neurologic surgery

Nose:

1. Cosmetic surgery of the nose
2. Non-healing granuloma of the nose
3. Surgery of the pterygopalatine fossa
4. LASER Surgery

Throat:

1. Oesophageal conditions in the practice of ear, nose and throat surgery
2. Disorders of speech
3. Lower respiratory conditions in Otolaryngology

Miscellaneous and head and neck

1. Functional Anatomy of cerebellum and brainstem

2. Anatomy of mediastinum
3. Pleura, plural cavity, broncho-pulmonary segments and their clinical importance
4. Facial plastic surgery

TEACHING AND LEARNING METHODS

Teaching methodology

Didactic lectures are of least importance; small group discussion such as seminars, journal clubs, symposia, reviews and guest lectures should get priority for theoretical knowledge. Bedside teaching, grand rounds, structured interactive group discussions and clinical demonstrations should be the hallmark of clinical/practical learning with appropriate emphasis on e-learning. Student should have hand-on training in performing various procedures and ability to interpret various tests/investigations. Exposure to newer specialized diagnostic/therapeutic procedures concerning her/his subject should be given. Self-learning tools like assignments and case-based learning may be promoted. Exposure to newer specialized diagnostic/therapeutic procedures concerning ENT should be given.

1. **Rotations:**
    - A major portion of posting should be in ENT Department. It should include in-patients, out-patients, ICU, trauma, emergency room, specialty clinics includingVertigo Clinic, Rhinology Clinic, Otology Clinic, Cancer Clinic, Cadaveric dissection Lab, Audiology and speech therapy.
    - Inter-unit rotation in the department should be done for a period of up to one year.
    - Rotation in appropriate related subspecialties for a total period not exceeding 06 months.
2. **Clinical meetings:**
   There should be intra- and inter- departmental meetings for discussing the uncommon /interesting cases involving multiple departments.
3. **Log book:** Each student must be asked to present a specified number of cases for clinical discussion, perform procedures/tests/operations/present seminars/review articles from various journals in inter-unit/interdepartmental teaching sessions. They should be entered in a Log Book. The Log books shall be checked and assessed periodically by the faculty members imparting the training.
4. **Thesis writing and research:**
   Thesis writing is compulsory.
5. The postgraduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.
6. A postgraduate student of a postgraduate degree course in broad specialities/super specialities would be required to present one poster presentation, to read one paper at

a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.

7. The student should know the basic concepts of research methodology, plan a research project, be able to retrieve information from the library. The student should have a basic knowledge of statistics.
8. Department should encourage e-learning activities.

During the training programme, patient safety is of paramount importance; therefore, skills are to be learnt initially on the models, later to be performed under supervision followed by performing independently; for this purpose, provision of surgical skills laboratories in the medical colleges is mandatory.

ASSESSMENT

Assessment should be comprehensive & objective. It should address the stated competencies of the course. The assessment needs to be spread over the duration of the course.

FORMATIVE ASSESSMENT, i.e., assessment during the training would include: Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self directed learning and ability to practice in the system.

General Principles

Internal Assessment should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills. The Internal Assessment should be conducted in theory and clinical examination.

Quarterly assessment during the MS training should be based on following educational activities:

1. **Journal based / recent advances learning**
2. **Patient based /Laboratory or Skill based learning**
3. **Self directed learning and teaching**
4. **Departmental and interdepartmental learning activity**
5. **External and Outreach Activities / CMEs**

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The student to be assessed periodically as per categories listed in postgraduate student appraisal form (Annexure I).

SUMMATIVE ASSESSMENT ie.,at the end of the training

The summative examination would be carried out as per the Rules given in POSTGRADUATE MEDICAL EDUCATION REGULATIONS, 2000.

The examination will be in three parts:

1. **Thesis**

Every post graduate student shall carry out work on an assigned research project under the guidance of a recognised Post Graduate Teacher, the result of which shall be written up and submitted in the form of a Thesis. Work for writing the Thesis is aimed at contributing to the development of a spirit of enquiry, besides exposing the candidate to the techniques of research, critical analysis, acquaintance with the latest advances in medical science and the manner of identifying and consulting available literature.

Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination. The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination. A candidate shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners.

2. Theory

The examinations shall be organised on the basis of 'Grading'or 'Marking system' to evaluate and to certify candidate's level of knowledge, skill and competence at the end of the training. Obtaining a minimum of 50% marks in 'Theory' as well as 'Practical' separately shall be mandatory for passing examination as a whole. The examination for MS shall be held at the end of 3rd academic year. An academic term shall mean six month's training period.

Theory shall consist of four papers of 3 hours each.

Paper I: Basic Sciences related Otolaryngology

Paper II: Principles and Practices of Otolaryngology

Paper III: Recent advances in Otolaryngology and Head Neck surgery.

Paper IV: General Surgical Principles and Head-Neck Surgery.

3. Clinical / Practical and viva voce Examination

Clinical examination shall be conducted to test the knowledge, skills, attitude and competence of the post graduate students for undertaking independent work as a

specialist/teacher, for which post graduate students shall examine a minimum one long case and two short cases.

The Oral examination shall be thorough and shall aim at assessing the post graduate student's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty, which form a part of the examination.

Assessment may include Objective Structured Clinical Examination(OSCE).

Oral/Viva-voce examination needs to assess knowledge on X-rays, instrumentation, operative procedures. Due weightage should be given to Log Book Records and day-to-day observation during the training.

Recommended Reading:

Books (latest edition)

- Scott-Brown's *Otorhinolaryngology and Head and Neck Surgery*
- Cummings *Otolaryngology - Head and Neck Surgery*
- *Otolaryngology, Otology &Neurotalogy* by Paprella&Micheal
- Glasscock-Shambaugh's*Surgery of the Ear*
- *Essentials of Functional Sinus Surgery* by Heinz Stammberger MD
- *Color Atlas of Head & Neck Surgery* by Jatin P Shah
- *Handbook of Clinical Audiology*by Jack Katz
- Stell& Maran's *Textbook of Head and Neck Surgery and Oncology*

Journals

03-05 international Journals and 02 national (all indexed) journals

Annexure I

Postgraduate Students Appraisal Form
Pre / Para /Clinical Disciplines

Name of the Department/Unit :

Name of the PG Student :

Period of Training : FROM.....TO.....

Sr. No.	PARTICULARS	Not Satisfactory	Satisfactory	More Than Satisfactory	Remarks
		1 2 3	4 5 6	7 8 9	
1.	Journal based / recent advances learning				
2.	Patient based /Laboratory or Skill based learning				
3.	Self directed learning and teaching				
4.	Departmental and interdepartmental learning activity				
5.	External and Outreach Activities / CMEs				
6.	Thesis / Research work				
7.	Log Book Maintenance				

Publications **Yes/ No**

Remarks*_____
_____
_____
_____

***REMARKS: Any significant positive or negative attributesof a postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.**

SIGNATURE OF ASSESSEE **SIGNATURE OF CONSULTANT** **SIGNATURE OF HOD**

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GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR MS IN OBSTETRICS AND GYNAECOLOGY

Preamble:

The purpose of PG education is to create specialists who would provide high quality health care and advance the cause of science through research & training.

The purpose of MS Obstetrics and Gynaecology is to standardize Obstetrics & Gynaecology teaching at Post Graduate level throughout the country so that it will benefit in achieving uniformity in undergraduate teaching as well and resultantly creating competent Obstetrician and Gynaecologist with appropriate expertise.

The purpose of this document is to provide teachers and learners illustrative guidelines to achieve defined outcomes through learning and assessment. This document was prepared by various subject-content specialists. The Reconciliation Board of Academic Committee has attempted to render uniformity without compromise to purpose and content of the document. Compromise in purity of syntax has been made in order to preserve the purpose and content. This has necessitated retention of “domains of learning” under the heading “competencies”.

SUBJECT SPECIFIC LEARNING OBJECTIVES

Programme Objectives

The **goal** of the MS course in Obstetrics and Gynaecology is to produce a competent Obstetrician and Gynaecologist who can:

a. Provide quality care to the community in the diagnosis and management of Antenatal, Intra-natal and Post-natal period of normal and abnormal pregnancy and labor.
b. provide effective and adequate care to a pregnant woman with complicated pregnancy.
c. provide effective and adequate care to a normal and high risk neonate.
d. perform obstetrical ultrasound in normal and abnormal pregnancy including Doppler.
e. manage effectively all obstetrical and gynecological emergencies and if necessary make appropriate referrals.
f. provide quality care to the community in the diagnosis and management of gynaecological problems including screening, and management of all gynecological cancers including during pregnancy.

g. conduct a comprehensive evaluation of infertile couple and have a broad based knowledge of assisted reproductive techniques including – ovulation induction, *in vitro* fertilization and intra-cytoplasmic sperm injection, gamete donation, surrogacy and the legal and ethical implications of these procedures.

h. provide counseling and delivery of fertility regulation methods including reversible and irreversible contraception, emergency contraception etc.

i. provide quality care to women having spontaneous abortion or requesting Medical Termination of Pregnancy (MTP) and manage their related complications.

SUBJECT SPECIFIC COMPETENCIES

A. Cognitive Domain

At the end of the MS Course in Obstetrics and Gynaecology, the student should have acquired knowledge in the following:

- recognizes the health needs of women and adolescents and carries out professional obligations in keeping with principles of National Health Policy and professional ethics
- has acquired the competencies pertaining to Obstetrics and Gynaecology that are required to be practiced in the community and at all levels of health system
- on genetics as applicable to Obstetrics.
- on benign and malignant gynecological disorders.
- on Gynecological Endocrinology and infertility.
- on interpretation of various laboratory investigations and other diagnostic modalities in Obstetrics & Gynecology.
- on essentials of Pediatric and adolescent Gynecology.
- on care of postmenopausal women and geriatric Gynecology.
- on elementary knowledge of female breast & its diseases.
- on vital statistics in Obstetrics & Gynecology.
- Anesthesiology related to Obstetrics & Gynecology.
- Reproductive and Child Health, family welfare & reproductive tract infections.
- STD and AIDS & Government of India perspective on women's health related issues.
- Medico-legal aspects in Obstetrics & Gynecology.
- Asepsis, sterilization and disposal of medical waste.
- be able to effectively communicate with the family and the community
- is aware of the contemporary advances and developments in medical sciences as related to Obstetrics and Gynaecology.

- maintain medical records properly and know the medico-legal aspects in respect of Obstetrics & Gynecology
- Understands the difference between audit and research and how to plan a research project and demonstrate the skills to critically appraise scientific data and literature
- has acquired skills in educating medical and paramedical professionals

Ethical and Legal Issues:

The post graduate student should understand the principles and legal issues surrounding informed consent with particular awareness of the implication for the unborn child, postmortem examinations consent to surgical procedures including tubal ligation/vasectomy, parental consent and medical certification, research and teaching and properly maintain medical records.

Risk Management:

The post graduate student should demonstrate a working knowledge of the principles of risk management and their relationship to clinical governance and complaints procedures.

Confidentiality:

The post graduate student should:

- be aware of the relevant strategies to ensure confidentiality and when it might be broken.
- understand the principles of adult teaching and should be able to teach common practical procedures in Obstetrics and Gynaecology and involved in educational programme in Obstetrics and Gynaecology for medical and paramedical staff.
- be abreast with all recent advances in Obstetrics and Gynaecology and practice evidence based medicine.

Use of information technology, audits and standards:

The post graduate student should:

- acquire a full understating of all common usage of computing systems including the principles of data collection, storage, retrieval, analysis and presentation.
- understand quality improvement and management and how to perform, interpret and use of clinical audit cycles and the production and application of clinical standards, guidelines and protocols.

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- understand National Health Programmes related to Obstetrics and Gynaecology and should be aware of all the Acts and Laws related to specialty.

Health of Adolescent Girls and Post-Menopausal Women

The student should:

- Recognize the importance of good health of adolescent and postmenopausal women.
- Identification and management of health problems of post-menopausal women.
- Understanding and planning and intervention program of social, educational and health needs of adolescent girls and menopausal women.
- Education regarding rights and confidentiality of women's health, specifically related to reproductive function, sexuality, contraception and safe abortion.
- Geriatric problems.

Reproductive Tract and 'HIV' Infection

- Epidemiology of RTI and HIV infection in Indian women of reproductive age group.
- Cause, effect and management of these infections.
- HIV infections in pregnancy, its effects and management.
- Relationship of RTI and HIV with gynaecological disorders.
- Planning and implementation of preventive strategies.

Medico-legal Aspects

- Knowledge and correct application of various Acts and Laws while practicing Obstetrics and Gynaecology, particularly MTP Act and sterilization, Preconception and P.N.D.T. Act.
- Knowledge of importance of proper recording of facts about history, examination findings, investigation reports and treatment administered in all patients.
- Knowledge of steps recommended for examination and management of rape cases.
- Knowledge of steps taken in the event of death of a patient.

B. Affective domain

1. Should be able to function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the patient and the clinician or other colleagues to provide the best possible diagnosis or opinion.

2. Always adopt ethical principles and maintain proper etiquette in dealings with patients, relatives and other health personnel and to respect the rights of the patient including the right to information and second opinion.
3. Develop communication skills to word reports and professional opinion as well as to interact with patients, relatives, peers and paramedical staff, and for effective teaching.

C. Psychomotor domain

At the end of the course, the student should acquire following clinical & operative skills and be able to:

Operative Skills in Obstetrics and Gynaecology

- Adequate proficiency in common minor and major operations, post-operative management and management of their complications.
- Operative procedures which must be done by P G students during training period: ***(in graded manner - assisting, operating with senior person assisting, operating under supervision)***

(Operations MUST BE DONE/OBSERVED during PG training programme and log book maintained)

1. Obstetrics: Venesection, culdocentesis
Conduct normal deliveries
Episiotomy and its repair

- Application of forceps and ventouse (10).
- Carry out caesarian section delivery (10 must be done)
- Manual removal of placenta
- Management of genital tract obstetrical injuries.
- Post partum sterilization/Minilap tubal ligation (20 must be done)
- Medical termination of pregnancy - various methods (20 must be done)

2. Gynaecology: Endometrial / cervical biopsy.
Dilatation and curettage
Coldocentesis, Colpotomy

- Opening and closing of abdomen (10 must be done)
- Operations for pelvic organ prolapse
- Ovarian cyst operation
- Operation for ectopic pregnancy
- Vaginal and abdominal hysterectomy

Operations must be OBSERVED and/or ASSISTED when possible:

- Internal podalic version
- Caesarea Hysterectomy
- Internal iliac artery ligation
- Destructive obstetrical operations
- Tubal microsurgery
- Radical operations for gynaec malignancies
- Repair of genital fistulae
- Operations for incontinence
- Myomectomy, Laparoscopic and hysteroscopic surgery

Diagnostic Procedures

- Interpretation of x-rays - Twins, common fetal malformations / mal-presentations, abnormal pelvis (pelvimetry), Hysterosalpingography
- Sonographic pictures at various stages of pregnancy - normal and abnormal pregnancies, Fetal biophysical profile, common gynaecological pathologies.
- Amniocentesis
- Fetal surveillance methods - Electronic fetal monitoring and its interpretation
- Post-coital test
- Vaginal Pap Smear
- Colposcopy
- Endoscopy - Laparo and Hystero-scopy.

Health of Adolescent Girls and Post-Menopausal Women

- Provide advice on importance of good health of adolescent and postmenopausal women.
- Identification and management of health problems of post-menopausal women.
- Planning and intervention program of social, educational and health needs of adolescent girls and menopausal women.
- Provide education regarding rights and confidentiality of women's health, specifically related to reproductive function, sexuality, contraception and safe abortion.
- Provide advice on geriatric problems.

Reproductive Tract and 'HIV' Infection

- Provide advice on management of RTI and HIV infections in Indian women of reproductive age group.

- Provide advice on management of HIV infections in pregnancy, relationship of RTI and HIV with gynaecological disorders.
- Planning and implementation of preventive strategies.

Medico-legal Aspects

- Correct application of various Acts and Laws while practicing obstetrics and gynaecology, particularly MTP Act and sterilization, Preconception and P.N.D.T. Act.
- Implement proper recording of facts about history, examination findings, investigation reports and treatment administered in all patients.
- Implement the steps recommended for examination and management of rape cases.
- Follow proper procedures in the event of death of a patient.

Environment and Health

- Follow proper procedures in safe disposal of human body fluids and other materials.
- Follow proper procedures and universal precautions in examination and surgical procedures for the prevention of HIV and other diseases.

Syllabus

Course Contents:

Paper I

1. Basic Sciences

- Normal and abnormal development, structure and function (female and male) urogenital system and female breast.
- Applied Anatomy of genito-urinary system, abdomen, pelvis, pelvic floor, anterior abdominal wall, upper thigh (inguinal ligament, inguinal canal, vulva, rectum and anal canal).
- Physiology of spermatogenesis.
- Endocrinology related to male and female reproduction (Neurotransmitters).
- Anatomy and physiology of urinary and lower GI (Rectum / anal canal) tract.
- Development, structure and function of placenta, umbilical cord and amniotic fluid.
- Anatomical and physiological changes in female genital tract during pregnancy.
- Anatomy of fetus, fetal growth and development, fetal physiology and fetal circulation.
- Physiological and neuro-endocrinal changes during puberty, adolescence, menstruation, ovulation, fertilization, climacteric and menopause.

- Biochemical and endocrine changes during pregnancy, including systemic changes in cardiovascular, hematological, renal hepatic, renal, hepatic and other systems.
- Biophysical and biochemical changes in uterus and cervix during pregnancy and labor.
- Pharmacology of identified drugs used during pregnancy, labour, post-partum period in reference to their absorption, distribution, excretion, (hepatic) metabolism, transfer of the drugs across the placenta, effect of the drugs (used) on labor, on fetus, their excretion through breast milk.
- Mechanism of action, excretion, metabolism of identified drugs used in the management of Gynaecological disorder.
- Role of hormones in Obstetrics and Gynaecology.
- ***Markers in Obstetrics & Gynaecology*** - Non-neoplastic and neoplastic diseases
- Pathophysiology of ovaries, fallopian tubes, uterus, cervix, vagina and external genitalia in healthy and diseased conditions.
- Normal and abnormal pathology of placenta, umbilical cord, amniotic fluid and fetus.
- Normal and abnormal microbiology of genital tract. Bacterial, viral and parasitical infections responsible for maternal, fetal and gynaecological disorders.
- Humoral and cellular immunology in Obstetrics & Gynaecology.
- Gametogenesis, fertilization, implantation and early development of embryo.
- Normal Pregnancy, physiological changes during pregnancy, labor and pauperism.
- Immunology of pregnancy.
- Lactation.

2. Medical Genetics

- Basic medical genetics including cytogenetics.
- Pattern of inheritance
- Chromosomal abnormalities - types, incidence, diagnosis, management and recurrence risk.
- General principles of Teratology.
- Screening, counseling and prevention of developmental abnormalities.
- Birth defects - genetics, teratology and counseling.

Paper II

Clinical obstetrics

1. Antenatal Care:

- Prenatal care of normal pregnancy including examination, nutrition, immunization and follow up.
- Identification and management of complications and complicated of pregnancy – abortion, ectopic pregnancy, vesicular mole, Gestational trophoblastic Diseases, hyperemesis gravidarum, multiple pregnancy, antipartum hemorrhage, pregnancy induced hypertension, preeclampsia, eclampsia, Other associated hypertensive disorders, Anemia, Rh incompatibility, diabetes, heart disease, renal and hepatic diseases, preterm - post term pregnancies, intrauterine fetal growth retardation,
- Neurological, hematological, dermatological diseases, immunological disorders and other medical and surgical disorders/problems associated with pregnancy, Multiple pregnancies, Hydramnios, Oligoamnios.
- Diagnosis of contracted pelvis (CPD) and its management.
- High-risk pregnancy
- Pregnancy associated with complications, medical and surgical problems.
- Prolonged gestation.
- Preterm labor, premature rupture of membranes.
- Blood group incompatibilities.
- Recurrent pregnancy wastage.
- Evaluation of fetal and maternal health in complicated pregnancy by making use of diagnostic modalities including modern once (USG, Doppler, Electronic monitors) and plan for safe delivery for mother and fetus. Identifying fetus at risk and its management. Prenatal diagnostic modalities including modern ones.
- Infections in pregnancy (bacterial, viral, fungal, protozoan)
- Malaria, Toxoplasmosis.
- Viral – Rubella, CMV, Herpes, HIV, Hepatic viral infections (B, C etc)
- Sexually Transmitted Infections (STDs)
- Mother to fetal transmission of infections.
- Identification and management of fetal malpositions and malpresentations.
- Management of pregnancies complicated by medical, surgical (with other specialties as required) and gynecological diseases.
- Anemia, hematological disorders
- Respiratory, Heart, Renal, Liver, skin diseases.
- Gastrointestinal, Hypertensive, Autoimmune, Endocrine disorders.
- Associated Surgical Problems.
  Acute Abdomen (surgical emergencies - appendicitis and GI emergencies).
  Other associated surgical problems.
- Gynaecological disorders associate with pregnancy - congenital genital tract developmental anomalies, Gynaec pathologies - fibroid uterus, Ca Cx, genital prolapse etc.
- Prenatal diagnosis (of fetal problems and abnormalities), treatment – Fetal therapy
- M.T.P, PC & P.N.D.T Act etc

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- National health MCH programs, social obstetrics and vital statistics
- Recent advances in Obstetrics.

2. Intra-partum care:

- Normal labor - mechanism and management.
- Partographic monitoring of labor progress, recognition of abnormal labor and its appropriate management.
- Identification and conduct of abnormal labor and complicated delivery - breech, forceps delivery, caesarian section, destructive operations.
- Induction and augmentation of labor.
- Management of abnormal labor - Abnormal pelvis, soft tissue abnormalities of birth canal, mal-presentation, mal-positions of fetus, abnormal uterine action, obstructed labor and other distocias.
- Analgesia and anaesthesia in labor.
- Maternal and fetal monitoring in normal and abnormal labor (including electronic fetal monitoring).
- Identification and management of intrapartum complications, Cord presentation, complication of 3rd stage of labor - retained placenta, inversion of uterus, rupture of uterus, post partum hemorrhage.

3. Post Partum

- Complication of 3rd stage of labor retained placenta, inversion of uterus, post partum hemorrhage, rupture of uterus, Management of primary and secondary post-partum hemorrhage, retained placenta, uterine inversion. Post-partum collapse, amniotic fluid embolism
- Identification and management of genital tract trauma - perineal tear, cervical/vaginal tear, episiotomy complications, rupture uterus.
- Management of critically ill woman.
- Post partum shock, sepsis and psychosis.
- Postpartum contraception.
  Breast feeding practice; counseling and importance of breast-feeding. Problems in breast-feeding and their management, Baby friendly practices.
- Problems of newborn - at birth (resuscitation), management of early neonatal problems.
- Normal and abnormal purpureum - sepsis, thrombophlebitis, mastitis, psychosis.
  Hematological problems in Obstetrics including coagulation disorders. Use of blood and blood components/products.

4. Operative Obstetrics:

- Decision-making, technique and management of complications.
- Vaginal instrumental delivery, Caesarian section, Obst. Hysterectomy, destructive operations, manipulations (External/internal podalic version, manual removal of placenta etc)
- Medical Termination of Pregnancy - safe abortion - selection of cases, technique and management of complication. MTP law.

5. New Born

1. Care of new born: Normal and high risk new born (including NICU care).
2. Asphyxia and neonatal resuscitation.
3. Neonatal sepsis - prevention, detection and management.
4. Neonatal hyper - bilirubinemia - investigation and management.
5. Birth trauma - Detection and management.
6. Detection and management of fetal/neonatal malformation.
7. Management of common neonatal problems.

Paper III

Clinical Gynaecology and Fertility Regulation

- Epidemiology and etiopathogenesis of gynaecological disorders.
- Diagnostic modalities and management of common benign and malignant gynaecological diseases (diseases of genital tract):
  Fibroid uterus
  Endometriosis and adenomyosis
  Endometrial hyperplasia
  Genital prolapse (uterine and vaginal)
  Cervical erosion, cervicitis, cervical polyps, cervical neoplasia.
  Vaginal cysts, vaginal infections, vaginal neoplasia (VIN)
  Benign Ovarian pathologies
  Malignant genital neoplasia - of ovary, Fallopian tubes, uterus, cervix, vagina, vulva and Gestational Trophoblastic diseases, Cancer Breast.
- Diagnosis and surgical management of clinical conditions related to congenital malformations of genital tract. Reconstructive surgery in gynaecology.
- Intersex, ambiguous sex and chromosomal abnormalities.
- Reproductive endocrinology: Evaluation of Primary/secondary Amenorrhea, management of Hyperprolactinemia, Hirsutism, Chronic an-ovulation, PCOD, thyroid and other endocrine dysfunctions.
- Infertility - Evaluation and management
    - Methods of Ovulation Induction

- Tubal (Micro) surgery
- Management of immunological factors of Infertility
- Male infertility
- Obesity and other Infertility problems.
- **(Introductory knowledge of)** Advanced Assisted Reproductive Techniques (ART)

- Reproductive tract Infections: prevention, diagnosis and treatment.
  - STD
  - HIV
  - Other Infections
  - Genital Tuberculosis.
- Principles of radiotherapy and chemotherapy in gynaecological malignancies. Choice, schedule of administration and complications of such therapies.
- Rational approach in diagnosis and management of endocrinal abnormalities such as: menstrual abnormalities, amenorrhea (primary/secondary), dysfunctional uterine bleeding, polycystic ovarian disease, hyperprolactinemia (galoctorrhea), hyperandrogenism, thyroid - pituitary - adrenal disorders, menopause and its treatment (HRT).
- Urological problems in Gynaecology - Diagnosis and management.
  - Urinary tract infection
  - Urogenital Fistulae
  - Incontinence
  - Other urological problems
- Orthopedic problems in Gynaecology.
- Menopause: management (HRT) and prevention of its complications.
- Endoscopy (Laparoscopy - Hysteroscopy)
  - Diagnostic and simple therapeutic procedures (PG students must be trained to do these procedures)
  - Recent advances in gynaecology - Diagnostic and therapeutic
  - Pediatric, Adolescent and Geriatric Gyanecology
  - **Introduction to Advance Operative procedures.**

Operative Gynaecology

- Abdominal and Vaginal Hysterectomy
- Surgical Procedures for genital prolapse, fibromyoma, endometriosis, ovarian, adenexal, uterine, cervical, vaginal and vulval pathologies.
- Surgical treatment for urinary and other fistulae, Urinary incontinence
- Operative Endoscopy

Family Welfare and Demography

- Definition of demography and its importance in Obstetrics and Gynaecology.

- Statistics regarding maternal mortality, perinatal mortality/morbidity, birth rate, fertility rate.
- Organizational and operational aspects of National health policies and programs, in relation to population and family welfare including RCH.
- Various temporary and permanent methods of male and female contraceptive methods.
- Knowledge of in contraceptive techniques (including recent developments).
    1. Temporary methods
    2. Permanent Methods.
    3. Recent advances in contraceptive technology
- Provide adequate services to service seekers of contraception including follow up.
- Medical Termination of Pregnancy: Act, its implementation, providing safe and adequate services.
- Demography and population dynamics.
- Contraception (fertility control)

Male and Female Infertility

- History taking, examination and investigation.
- Causes and management of male infertility.
- Indications, procedures of Assisted Reproductive Techniques in relation to male infertility problems.

TEACHING AND LEARNING METHODS

Postgraduate Training

Teaching methodology should be imparted to the students through:

- Lectures, seminars, symposia, Inter- and intra- departmental meetings (clinic-pathological, Radio-diagnosis, Radiotherapy, Anaesthesia, Pediatrics/ Neonatology), maternal morbidity/mortality meetings and journal club. ***Records of these are to be maintained by the department.***
- By encouraging and allowing the students to attend and actively participate in CMEs, Conferences by presenting papers.
- Maintenance of log book: Log books shall be checked and assessed periodically by the faculty members imparting the training.
- Writing thesis following appropriate research methodology, ethical clearance and good clinical practice guidelines.
- The postgraduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.

- A postgraduate student of a postgraduate degree course in broad specialities/super specialities would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.
- Department should encourage e-learning activities.

Practical and Clinical Training

- Emphasis should be self learning, group discussions and case presentations.
- Student should be trained about proper History taking, Clinical examination, advising / ordering relevant investigations, their interpretation and instituting medical / surgical management by posting students in OPD, specialty clinics, wards, operation theaters, Labor room, family planning clinics and other departments like anesthesiology, neonatology, radiology/ radiotherapy. **Students should be able to perform and interpret ultra - sonography in Obstetrics and Gynaecology, NST, Partogram**

Rotations:

- Details of 3 years posting in the PG programme (6 terms of 6 months each)

a. Allied posts should be done during the course *– for 8 weeks*

i.	Neonatology	- 2 weeks
ii.	Anaesthesia	- 2 weeks
iii.	Radiology/Radiotherapy	- 2 weeks
iv.	Surgery	- 2 weeks
v.	Oncology	- 2 weeks

b. Details of training in the subject during resident posting

The student should attend to the duties (Routine and emergency):

Out patient Department and special clinics

Inpatients

Operation Theater

Labor Room

Writing clinical notes regularly and maintains records.

1st term - working under supervision of senior residents and teaching faculty.

2nd & 3rd term-	***Besides patient care in O.P.D., wards, Casualty and labor room, carrying out minor operations under supervision and assisting in major operation.***
4th 5th & 6th term -	***independent duties in management of patient including major operations under supervision of teaching faculty***

c. Surgeries to be done during PG training. **(Details in the Syllabus)**

During the training programme, patient safety is of paramount importance; therefore, skills are to be learnt initially on the models, later to be performed under supervision followed by performing independently; for this purpose, provision of surgical skills laboratories in medical colleges is mandatory.

ASSESSMENT

FORMATIVE ASSESSMENT, during the training includes

Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self directed learning and ability to practice in the system.

General Principles

Internal Assessment should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills. The Internal Assessment should be conducted in theory and clinical examination.

Quarterly assessment during the MS training should be based on following educational activities:

1. **Journal based / recent advances learning**
2. **Patient based /Laboratory or Skill based learning**
3. **Self directed learning and teaching**
4. **Departmental and interdepartmental learning activity**
5. **External and Outreach Activities / CMEs**

The student to be assessed periodically as per categories listed in postgraduate student appraisal form (Annexure I).

SUMMATIVE ASSESSMENT, ie., assessment at the end of training

The summative examination would be carried out as per the Rules given in POSTGRADUATE MEDICAL EDUCATION REGULATIONS, 2000.

Postgraduate Examination shall be in three parts:

1. Thesis

Every post graduate student shall carry out work on an assigned research project under the guidance of a recognised Post Graduate Teacher, the result of which shall be written up and submitted in the form of a Thesis. Work for writing the Thesis is aimed at contributing to the development of a spirit of enquiry, besides exposing the post graduate student to the techniques of research, critical analysis, acquaintance with the latest advances in medical science and the manner of identifying and consulting available literature.

Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination. The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination. A post graduate student shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners.

2. Theory Examination:

The examinations shall be organised on the basis of 'Grading'or 'Marking system' to evaluate and to certify post graduate student's level of knowledge, skill and competence at the end of the training. Obtaining a minimum of 50% marks in 'Theory' as well as 'Practical' separately shall be mandatory for passing examination as a whole. The examination for M.D./ MS shall be held at the end of 3rd academic year. An academic term shall mean six month's training period**.**

There should be four theory papers, as given below:

Paper I: Applied Basic sciences.
Paper II: Obstetrics including social obstetrics and Diseases of New Born
Paper III: Gynaecology including fertility regulation
Paper IV: Recent Advances in Obstetrics & Gynaecology

3. Clinical/Practical & oral/viva voce Examination: shall be as given below:

a) Obstetrics:

Clinical

Long Case: 1 case
2 cases with different problems

Short Case/ Spot Case: 1 case

Viva voce including:

- Instruments
- Pathology specimens
- Drugs and X-rays, Sonography etc.
- Dummy Pelvis

b) Gynaecology:

Clinical

Long Case: 1 case

2 cases with different problems

Short Case/ Spot Case: 1 case

Viva including:

- Instruments
- Pathology specimens
- Drugs and X-rays, Sonography etc.
- Family planning

Recommended Reading:

Books (latest edition)

Obstetrics

1. William Textbook of Obstetrics
2. High risk Obstetrics - James
3. High risk pregnancy - Ian Donal
4. Text book of Operative Obstetrics - Munro Kerr.
5. Medical disorder in pregnancy - De Sweit
6. High risk pregnancy - Arias
7. A text book of Obstetrics - Thrnbull
8. Text book of Obstetrics - Holland & Brews.
9. Manual of Obstetrics - Daftary & Chakravarty

Gynaecology

1. Text book of Gynaecology - Novak
2. Text book of Operative Gynaecology - Te-lindes
3. Text book of operative gynaecology - Shaws
4. Text book of Gynaecology and Reproductive Endocrinology - Speroft
5. Text book of Obstetrics & Gynaecology - Dewhurst
6. Manual of Gynaecological Oncology - Disai
7. Text book of Gynaecology – Jaeffcot

Journals

03-05 international Journals and 02 national (all indexed) journals

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Annexure I

Postgraduate Students Appraisal Form
Pre / Para /Clinical Disciplines

Name of the Department/Unit :

Name of the PG Student :

Period of Training : FROM.....TO.....

Sr. No.	PARTICULARS	Not Satisfactory	Satisfactory	More Than Satisfactory	Remarks
		1 2 3	4 5 6	7 8 9	
1.	Journal based / recent advances learning				
2.	Patient based /Laboratory or Skill based learning				
3.	Self directed learning and teaching				
4.	Departmental and interdepartmental learning activity				
5.	External and Outreach Activities / CMEs				
6.	Thesis / Research work				
7.	Log Book Maintenance				

Publications **Yes/ No**

Remarks*_____
_____
_____
_____

***REMARKS: Any significant positive or negative attributes of a postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.**

SIGNATURE OF ASSESSEE **SIGNATURE OF CONSULTANT** **SIGNATURE OF HOD**

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GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR MS IN OPHTHALMOLOGY

Preamble:

The purpose of PG education is to create specialists who would provide high quality health care and advance the cause of science through research & training.

The purpose of this programme is to standardize Ophthalmology teaching at post graduate level throughout the country so that it will benefit in achieving uniformity in post graduate and undergraduate teaching as well as result in creating competent ophthalmic surgeons with appropriate expertise.

The purpose of this document is to provide teachers and learners illustrative guidelines to achieve defined outcomes through learning and assessment. This document was prepared by various subject-content specialists. The Reconciliation Board of the Academic Committee has attempted to render uniformity without compromise to purpose and content of the document. Compromise in purity of syntax has been made in order to preserve the purpose and content. This has necessitated retention of “domains of learning” under the heading “competencies”.

SUBJECT SPECIFIC LEARNING OBJECTIVES

Programme Objectives

The clinical post graduate training programmes are intended at developing in a student a blend of qualities that of a clinical specialist, a teacher and a researcher. These programmes are organized such that a post graduate student should possess the following qualities, knowledge and skills:

a. The student should possess basic knowledge of the structure, function and development of the human body as related to ophthalmology, of the factors which may disturb these mechanisms and the disorders of structure and function which may result thereafter.
b. The student should be able to practice and handle most day-to-day problems independently in ophthalmology. The student should recognize the limitations of his/her own clinical knowledge and know when to seek further help.
c. The student should understand the effects of environment on health and be familiar with the epidemiology of at least the more common diseases in the field of ophthalmology.

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d. The student should be able to integrate the preventive methods with the curative and rehabilitative measures in the comprehensive management of the disease.

e. The student should be familiar with common eye problems occurring in rural areas and be able to deal with them effectively.

f. The student should also be made aware of Mobile Ophthalmic Unit and its working and components.

g. The student should be familiar with the current developments in Ophthalmic Sciences.

h. The student should be able to plan educational programmes in Ophthalmology in association with senior colleagues and be familiar with the modern methods of teaching and evaluation.

i. The student should be able to identify a problem for research, plan a rational approach to its solution, execute it and critically evaluate his/her data in the light of existing knowledge.

j. The student should reach the conclusions by logical deduction and should be able to assess evidence both as to its reliability and its relevance.

k. The student should have basic knowledge of medico-legal aspects of medicine.

l. The student should be familiar with patient counseling and proper consent taking.

SUBJECT SPECIFIC COMPETENCIES

A post graduate student upon successfully qualifying in the M.S. (Ophthalmology) examination should be able to:

a) Offer to the community, the current quality of 'standard of care' in ophthalmic diagnosis as well as therapeutics, medical or surgical, in most of the common situations encountered at the level of health services.

b) Periodically self assess his or her performance and keep abreast with ongoing advances in the field and apply the same in his/her practice.

c) Be aware of her/his own limitations to the application of the specialty in situations, which warrant referral to more qualified centers or individuals.

d) Apply research and epidemiological methods during his/her practice. The post graduate student should be able to present or publish work done by him/her.

e) Contribute as an individual/group towards the fulfillment of national objectives with regard to prevention of blindness.

f) Effectively communicate with patients or relatives so as to educate them sufficiently and give them the full benefit of informed consent to treatment and ensure compliance.

At the end of the course, the student should have acquired knowledge in the following:

A. Cognitive domain

Basic Medical Sciences:

- Attain understanding of the structure and function of the eye and its parts in health and disease.
- Attain understanding and application of knowledge of the structure and function of the parts of Central Nervous System and other parts of the body with influence or control on the structure and function of the eye.
- Attain understanding of and develop competence in executing common general laboratory procedures employed in diagnosis and research in Ophthalmology.

1. Clinical Ophthalmology:

Given adequate opportunity to work on the basis of graded responsibilities in outpatients, inpatient and operation theatres on a rational basis in the clinical sections from the day of entry to the completion of the training programme, the students should be able to:

- Acquire scientific and rational approach to the diagnosis of ophthalmic cases presented.
- Acquire understanding of and develop inquisitiveness to investigate to establish cause and effect of the disease.
- To manage and treat all types of ophthalmic cases.
- To competently handle and execute safely all routine surgical procedures on lens, glaucoma, lid, sac, adnexa, retina and muscle anomalies.
- To competently handle all ophthalmic medical and surgical emergencies.
- To be familiar with micro-surgery and special surgical techniques.
- To demonstrate the knowledge of the pharmacological (including toxic) aspects of drugs used in ophthalmic practice and drugs commonly used in general diseases affecting the eyes.

2. Refraction:

- Acquire competence in assessment of refractive errors and prescription of glasses for all types of refraction problems.
- Acquire basic knowledge of manufacture and fitting of glasses and competence of judging the accuracy and defects of the dispensed glasses.

3. Ophthalmic super-specialties:

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Given an opportunity to work on a rotational basis in various special clinics of sub-specialties of ophthalmology, if possible, the student should be able to:

- Examine, diagnose and demonstrate understanding of management of the problems of neuro-ophthalmology and refer appropriate cases to neurology and neuro-surgery.
- Examine, diagnose and demonstrate understanding of management of (medical and surgical) complicated problems in the field of (a) lens, (b) glaucoma, c) cornea, (d) retina, (e) pediatric ophthalmology, (f) oculoplasty, (g) uvea, and (I) genetic problems in ophthalmology.
- To demonstrate understanding of the manufacture, and competence in prescription and dispensing of contact lenses and ocular prosthesis.

5. Ophthalmic pathological/microbiological/biochemical sciences

- Be able to interpret the diagnosis in correlation with the clinical data and routine materials received in such cases.

6. Community Ophthalmology

Eye camps may be conducted where the PG students are posted for imparting training to according to a set methodology. The community and school surveys may also be conducted by the post graduate students.

The post graduate students are given an opportunity to participate in surveys, eye camps. They should be able to guide rehabilitation workers in the organisation and training of the blinds in art of daily living and in the vocational training of the blind leading to gainful employment.

7. Research :

- Recognise a research problem.
- State the objectives in terms of what is expected to be achieved in the end.
- Plan a rational approach with appropriate controls with full awareness of the statistical validity of the size of the material.
- Spell out the methodology and carry out most of the technical procedures required for the study.
- Accurately and objectively record on systematic lines results and observation made.
- Analyze the data with the aid of an appropriate statistical analysis.

- Interpret the observations in the light of existing knowledge and highlight in what ways the study has advanced existing knowledge on the subject and what further remains to be done.
- Write a thesis in accordance with the prescribed instructions.
- Write at least one scientific paper as expected of International Standards from the material of this thesis.

B. Affective Domain:

1. Should be able to function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the patient and the clinician or other colleagues to provide the best possible diagnosis or opinion.

2. Always adopt ethical principles and maintain proper etiquette in dealings with patients, relatives and other health personnel and to respect the rights of the patient including the right to information and second opinion.

3. Develop communication skills to word reports and professional opinion as well as to interact with patients, relatives, peers and paramedical staff, and for effective teaching.

C. Psychomotor domain

At the end of the course, the student should acquire following clinical skills:

Essential diagnostic skills:

I. Examination techniques along with interpretation

1. Slit lamp Examination

i. Diffuse examination
ii. Focal examination
iii. Retroillumination – direct and indirect
iv. Sclerotic scatter
v. Specular reflection
vi. Staining modalities and interpretation

2. Fundus evaluation

- Direct/Indirect ophthamoscopy
- Fundus drawing
- 3-mirror examination of the fundus
- 78-D/90-D/60-D examination
- Amsler’s charting

II. Basic investigations along with their interpretation

1. Tonometry

Tonometry - Applanation/Identation/Non-contact

2. Gonioscopy

Gonioscopy grading of the anterior chamber angle

3. Tear/ Lacrimal function tests

i. Staining- fluorescein and Rose Bengal
ii. Schirmer test/tear film break up time
iii. Syringing
iv. Dacrocystography

4. Corneal

- Corneal scraping and cauterization
- Smear preparation and interpretation (Gram's stain /KOH)
- Media inoculation
- Keratometry - performance and interpretation
- Pachymetry
- Corneal topography - if available

5. Colour Vision evaluation

- Ishihara pseudoisochromatic plates
- Farnsworth Munsell, if available

6. Refraction

i. Retinoscopy- Streak/ Priestley Smith
ii. Use of Jackson's cross-cylinder
iii. Subjective and objective refraction
iv. Prescription of glasses

7. Diagnosis and assessment of Squint

i. Ocular position and motility examination
ii. Synoptophore usage
iii. Lees screen usage
iv. Diplopia charting
v. Assessment of strabismus - cover tests/prisms bars
vi. Amblyopia diagnosis and treatment
vii. Assessment of convergence, accommodation, stereopsis, suppression

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8. Exophthalmometry

Usage of Hertel's exophthalmometer - proptosis measurement

9. Contact lenses

- Fitting and assessment of RGP and soft lenses
- Subjective verification of over refraction
- Complications arising of contact lens use
- Educating the patient regarding CL usage and imparting relevant knowledge of the complications arising thereon

10. Low Vision Aids

- Knowledge of basic optical devices available and relative advantages and disadvantages of each.
- The basics of fitting with knowledge of availability & cost

III. The post graduate must be well versed with the following investigative modalities although the student may or may not perform it individually. But, she/he should be able to interpret results of the following tests:

1. Fundus photography
2. Fluorescein angiography
3. Ophthalmic ultrasound A-scan/B scan
4. Automated perimetry for glaucoma and neurological lesions
5. Radiological tests - X rays - Antero posterior/ Lateral view
   PNS (Water's view) / Optic canal views

   Localisation of intra-ocular and intra-orbital FBs

   Interpretations of -USG/ CT/ MRI Scans
6. OCT and UBM
7. ERG, EOG, and VEP

IV. Minor surgical procedures – Must know and perform independently

- Conjunctival and corneal foreign body removal on the slit lamp
- Chalazion incision and curettage
- Pterygium excision
- Biopsy of small lid tumours
- Suture removal- skin/conjunctival/corneal/ corneoscleral
- Tarsorrhaphy
- Subconjunctival injection
- Retrobulbar, parabulbar anaesthesia
- Posterior Sub-Tenon's injections

- Artificial eye fitting

V. Surgical procedures

1. Must know and can perform independently

a. Ocular anaesthesia:

- Retrobulbar anaesthesia
- Peribulbar anaesthesia
- Facial blocks- O'Brein / Atkinson/Van lint and modifications
- Frontal blocks
- Infra orbital blocks
- Blocks for sac surgery

2. Must be able to independently perform and deal with complications arising from the following surgeries :

- Lid Surgery - Tarsorrhaphy
  Ectropion and entropion
  Lid repair following trauma
  Epilation
- Destructive procedures
  Evisceration with or without implant
  Enucleation with or without implant

- Sac surgery
  i. Dacryocystectomy
  ii. Dacryocystorhinostomy
  iii. Probing for congenital obstruction of nasolacrimal duct

- Strabismus surgery
  Recession and resection procedures on the horizontal recti.
- Orbit surgery
  Incision and drainage via anterior orbitotomy for abscess
- Cyclocryotherapy/Cyclophotocoagulation

3. PG Students should be well conversant with use of operating microscope and must be able to perform the surgeries listed below competently under the same:

- Cataract surgery
  i. Standard ECCE (extracapsular cataract extraction; first year) with or without IOL implantation

ii. Small incision ECCE with or without IOL implantation and/or Phacoemulsification with PC IOL implantation

iii. Intracapsular cataract extraction (second year)

iv. Cataract with Phacoemusification (third year)

v. Secondary AC or PC IOL implantation

- Vitrectomy/Scleral buckling
    - Intra-vitreal and intra-cameral (anterior chamber) injection techniques and doses of drugs for the same
    - Needs to know the basis of open sky vitrectomy (anterior segment) as well as management of cataract surgery complications.
    - Assisting vitrectomy and scleral buckling procedures
- Ocular surface procedures

  Pterygium excision with modifications

  Conjunctival cyst excision/foreign body removal

  Corneal foreign body removal

  Conjunctival flap/ peritomy
- Glaucoma

  Trabeculectomy
- Corneal

  Repair of corneo - scleral perforations

  Corneal suture removal

  Application of glue and bandage contact lens

4. Should have performed/assisted the following microscopic surgeries

   i. Keratoplasty

   Therapeutic and optical

   ii Glaucoma surgery

   Pharmacological modulation of trabeculectomy

   Trabeculotomy

   Goniotomy

   Glaucoma valve implant surgery

5. Desirable to be able to perform following laser procedures
    - Yag Capsulotomy
    - Laser iridotomy
    - Focal and panretinal photocoagulation
6. Should have assisted/knowledge of Keratorefractive procedures

Operations:

The PG is provided with an opportunity to perform operations both extra-ocular and intra-ocular with the assistance of the senior post graduate students and/or under the direct supervision of a faculty member. The student is provided with an opportunity

to learn special and complex operations by assisting the senior post graduate student or the faculty in operations of cases of the specialty and be responsible for the post-operative care of these cases.

In **first phase**, the post graduate student is given training in preparations of cases for operation, pre-medication and regional anaesthetic blocks. In the **next phase**, the post graduate student assists the operating surgeon during the operations. In the **third phase**, the post graduate student operates independently assisted by senior post graduate student or a faculty member. She/he is required to be proficient in some operations and show familiarity with others.

Syllabus

Course contents:

These are only broad guidelines and are illustrative, there may be overlap between sections.

I. Basic Sciences:

1. Orbital and ocular anatomy
    i. Gross anatomy
    ii. Histology
    iii. Embryology
2. Ocular Physiology
3. Ocular Pathology
4. Ocular Biochemistry
    General biochemistry, biochemistry applicable to ocular function
5. Ocular Microbiology
    General Microbiology, specific microbiology applicable to the eye
6. Immunology with particular reference to ocular immunology
7. Genetics in ophthalmology
8. Community Eye Health

II. Optics

a. Basic physics of optics
b. Applied ophthalmic optics
c. Applied optics including optical devices
d. Disorders of Refraction

III. Clinical Ophthalmology

i. Disorders of the lids
ii. Disorders of the lacrimal system
iii. Disorders of the Conjunctiva
iv. Disorders of the Sclera

v. Disorders of the Cornea
vi. Disorders of the Uveal Tract
vii. Disorders of the Lens
viii. Disorders of the Retina
ix. Disorders of the Optic Nerve and Visual Pathway
x. Disorders of the Orbit
xi. Glaucoma
xii. Neuro-ophthalmology
xiii. Paediatric ophthalmology
xiv. Ocular involvement in systemic disease
xv. Immune ocular disorders
xvi. Strabismus and Amblyopia
xvii. Ocular oncology

TEACHING AND LEARNING METHODS

Teaching Methodology:

The theoretical knowledge is imparted to the post graduate student through distinct courses of lecture demonstrations, seminars, symposia and inter- and intra-departmental meetings. The students are exposed to recent advances through discussions in journal clubs and participation in CMEs, and symposia.

The post graduate students are imparted clinical training in several ways:

1. ***Group Discussion***

   The junior post graduate students may present the symposium to their senior postgraduates where it is fully discussed before finally being discussed in front of the faculty or senior eye specialists. A free and fair discussion is encouraged. These discussions enable the post graduate students to prepare for a general discussion in the class.

2. ***Clinical Case discussion***

a. Bedside discussion on the rounds and outpatient teaching take their toll with patient management. Therefore in addition to these, clinical case discussions should form part of a department's schedule at a fixed time every week. This could range from 1-2 hours and could be held at least once a week. The choice and manner of presentation and discussion varies widely and is left to the discretion of the department. Every effort should be made to include as wide a variety of cases as possible over three years with multiple repetitions. Problem oriented approach is better as it aids in decision making skills.

b. In addition to bedside teaching rounds, at least 5-hr of formal teaching per week are necessary.

c. Consultant case presentation is another approach which should be encouraged as it aids in solving complex problems and also is forum for discussion of interesting cases.

d. Case discussions on the patient's records written by the student is to be encouraged as it helps exercise the student's diagnostic and decision making skills. It also helps the consultant in critical evaluation of the student's progress academically.

e. Case presentation at other in-hospital multidisciplinary forums.

f. The postgraduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.

g. Department should encourage e-learning activities.

3. Seminars

Seminars should be conducted at least once weekly. The duration should be at least one hour. The topics selected should be repeated once in 3 years so as to cover as wide a range of topics as possible. Seminars could be individual presentations or a continuum (large topic) with many post graduate students participating.

4. Journal clubs

Journals are reviewed in particular covering all articles in that subject over a 6 months period and are discussed by the post graduate student under the following headings.

1) Aim 2) Methods 3) Observations
4) Discussions and 5) Conclusions

The post graduate student to whom the journal is allotted presents the journal summaries to the senior postgraduates. They are expected to show their understanding of the aspects covered in the article and clarify any of the points raised in the article, offer criticisms and evaluate the article in the light of known literature.

5. A postgraduate student of a postgraduate degree course in broad specialities/super specialities would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.

6. Out-Patients: For the first six months of the training programme, post graduate students may be attached to a faculty member to be able to pick up methods of history taking and ocular examination in ophthalmic practice. During this period

the post graduate student may also be oriented to the common ophthalmic problems. After 6 months, the clinical post graduate student may work independently, where he receives new and old cases including refractions and prescribes for them. The post graduate students are attached to a senior post graduate student and faculty member whom they can consult in case of difficulty.

7. **Wards:** Each post graduate student may be allotted beds in the in-patient section depending upon the total bed capacity and the number of the post graduates. The whole concept is to provide the post graduate student increasing opportunity to work with increasing responsibility according to seniority. A detailed history and case record is to be maintained by the post graduate student.

Relevance of beds and admissions in Ophthalmology has really gone down at present, as most of the surgical and special investigative procedures are being performed on out-patient basis. Most of the teaching has to be imparted in out-patients department and special Clinics.

8. **Rotations: Specialty clinics**

The student may rotate in the following subspecialty clinics:

- Anterior segment and cataract
- Glaucoma
- Oculoplastics
- Paediatric ophthalmology and strabismus
- Retina and Uvea
- Cornea, Contact lens and low vision
- Neuroophthalmology
- Refractive Clinic

9. **Practicals in Ocular Histopathology**

The post graduate students may be provided with fully stained slides of the ocular tissues along with relevant clinical data and discuss the diagnosis and differential diagnosis on the basis of the information provided

10. Attend accredited scientific meetings (CME, Symposia, and Conferences).

11. Additional sessions on basic sciences, biostatistics, research methodology, teaching methodology, hospital waste management, health economics, medical ethics and legal issues related to ophthalmology practice are suggested.

13. Maintenance of **log book**: Log books shall be checked and assessed periodically by the faculty members imparting the training.

During the training programme, patient safety is of paramount importance; therefore, skills are to be learnt initially on the models, later to be performed under supervision followed by performing independently; for this purpose, provision of surgical skills laboratories in medical colleges is mandatory.

ASSESSMENT

FORMATIVE ASSESSMENT, ie, during the training

Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self directed learning and ability to practice in the system.

FORMATIVE ASSESSMENT, ie., during the training

General Principles

Internal Assessment should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills. The Internal Assessment should be conducted in theory and clinical examination.

Quarterly assessment during the MS training should be based on following educational activities:

1. **Journal based / recent advances learning**
2. **Patient based /Laboratory or Skill based learning**
3. **Self directed learning and teaching**
4. **Departmental and interdepartmental learning activity**
5. **External and Outreach Activities / CMEs**

The student to be assessed periodically as per categories listed in postgraduate student appraisal form (Annexure I)

SUMMATIVE ASSESSMENT, ie., assessment at the end of training

The summative examination would be carried out as per the Rules given in **POSTGRADUATE MEDICAL EDUCATION REGULATIONS, 2000.**

The Post Graduate examination shall be in three parts:

1. Thesis:

Every post graduate student shall carry out work on an assigned research project under the guidance of a recognised Post Graduate Teacher, the result of which shall

be written up and submitted in the form of a Thesis. Work for writing the Thesis is aimed at contributing to the development of a spirit of enquiry, besides exposing the post graduate student to the techniques of research, critical analysis, acquaintance with the latest advances in medical science and the manner of identifying and consulting available literature.

Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination. The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination. A post graduate student shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners. From regulations)

2. Theory Examination:

The examinations shall be organised on the basis of 'Grading'or 'Marking system' to evaluate and to certify post graduate student's level of knowledge, skill and competence at the end of the training. Obtaining a minimum of 50% marks in 'Theory' as well as 'Practical' separately shall be mandatory for passing examination as a whole. The examination for M.D./ MS shall be held at the end of 3rd academic year. An academic term shall mean six month's training period.

There shall be four theory papers.

Paper I: Basic Sciences related to Ophthalmology, Refraction & Optics

Paper II: Clinical Ophthalmology

Paper III: Systemic Diseases in Relation to Ophthalmology

Paper IV: Recent Advances in Ophthalmology and Community Ophthalmology

3. Clinical/Practical and oral/viva voce examination

Clinical

1 long case

2 short cases with different problems

2 fundus Cases

1 refraction case

. **Oral/Viva voce Examination shall be comprehensive enough to test the** post graduate student**'s overall knowledge of the subject and shall include:**

i. Instruments
ii. Pathology specimens
iii. Drugs, X-rays, USG/OCT/CT/MRI Scans, etc.
iv. Visual fields and other ophthalmic diagnostic charts

Recommended Reading:

Books (latest edition)

1. Ophthalmic Surgery: Principles and Techniques. Blackwell Science. Albert DM.
2. Principles and Practice of Ophthalmology. Albert DM, Jakobiec. W B Saunders
3. Principles & Practice of Ophthalmology. Gholam A Paymen
4. The Current American Academy of Ophthalmology Basic and Clinical Science Course (13 volumes)
5. Duke Elder's Practice of Refraction. Abrams D. Churchill Livingstone.
6. Text book of Ophthalmology. Yanoff and Duker
7. Retina. Stephen J Ryan:
8. Ophthalmic Ultrasound: Sandra Byrne and Ronald Green.
9. Cornea: Fundamentals, Diagnosis, and Management. Krachmer JH, Mannis MJ, Holland EJ. Mosby Elsevier.
10. Ophthalmology. Yanoff N, Duker JS. Mosby Elsevier.
11. Review of Ophthalmology. Friedman NJ, Kaiser PK, Trattler WB. Elseview Saunders, Philadelphia.
12. Corneal Transplantation. Vajpayee RB. Jaypee Brothers Medical Publishers (P) Ltd, New Delhi.
13. Fundamentals of Clinical Ophthalmology Series. Coster D. Cornea. Blackwell Publishing Limited.
14. The Contact Lens Manual. A practical guide to fitting. Gasson A, Morris A J. Butterworth Heinemann Elsevier.
15. Steinert's cataract surgery.
16. Shields Text book of glaucoma
17. Smith and Nozik : Uvea
18. Rootman's diseases of the orbit
19. Eyelid, conjunctival and orbital tumors. An atlas and textbook. Shields JA, Shields CL. Philadelphia: Lippincott Williams & Wilkins.
20. Intraocular tumors. An atlas and textbook. Shields JA, Shields CL.
21. Pediatric Ophthalmology. Taylor and Hoyt: Saunders Ltd.
22. Management of Strabismus and Amblyopia. Pratt-Johnson and Tilson: Thieme Verlag.
23. Handbook of Pediatric Eye and Systemic disease. Wright, Spiegel and Thompson.
24. BinocularVision and Ocular Motility. Theory and Management of Strabismus. Von Noorden GK. Mosby.
25. Surgical Management of Strabismus. Helveston:
26. Strabismus: A Decision Making Approach. Von Noorden and Helveston:
27. Thyroid Eye Diseases. Char DR. Williams and Wilkins, Baltimore.

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28. A Manual of Systematic Eyelid Surgery.Collin JRO (ed). Churchill Livingstone, Edinburgh.
29. Refractive Surgery. Agarwal A, Agarwal A, Jacob Soosan. Jaypee.
30. LASIK Complications, Prevention and management. Gimbel HV, Penno EEA. Slack Inc.
31. Management of Complications of Refractive Surgery. Alio JL, Azar DT. Springer.
32. Quality of Vision: Essential Optics for the Cataract and Refractive Surgeon. Holladay JT. Slack Inc.
33. Ocular Pharmacology: Havener
34. Anatomy: Wolff 's Anatomy of the Eye and Orbit
35. Physiology: Adler's Physiology of the Eye
36. Textbook of Ophthalmology (2 volumes). Easty DL, Sparrow JM.Oxford Oxford Medical Publications.
37. The Eye. Basic Sciences in Practice. Forrester JV, Dick AD, McMenamin PG, Lee WR. W B Saunders.
38. A Stereoscopic Atlas of Macular Diseases: Diagnosis and Treatment. Gass JDM.
39. Neuroophthalmology. Glaser JS. LipincottWilliams & Wilkins. .
40. Clinical Ophthalmic Pathology. Harry J, Misson G. Butterworth/Heinemann.
41. Inherited Retinal Diseases. A Diagnostic Guide. Jimenez Sierra JM, Ogden TE, Van Boemel GB. Mosby.
42. Clinical Ophthalmology. Kanski JJ. Butterworth/Heinemann.
43. ABC of Resuscitation. Colquhoun, M. C., Evans, T. R., Handley, A. J. BMJ Publishing Group.
44. Walsh and Hoyt's Clinical Neuroophthalmology (5 volumes). Miller NR, Newman NJ, Williams and Wilkins.
45. The human eye. Oyster CW Sinauer Associates. Sunderland. Massachusetts
46. Paediatric Ophthalmology. Taylor D. Blackwell Science.
47. Decision Making in Ophthalmology. Van Heuven WAJ, Zwann J. Mosby.
48. Parsons' Diseases of the eye. Sihota and Tandon.
49. Wills Eye Manual
50. International Council of Ophthalmology Residency Curriculum available at http://www.icoph.org/

Journals

03-05 international Journals and 02 national (all indexed) journals

Annexure I

Postgraduate Students Appraisal Form
Pre / Para /Clinical Disciplines

Name of the Department/Unit :

Name of the PG Student :

Period of Training : FROM……TO……

Sr. No.	PARTICULARS	Not Satisfactory	Satisfactory	More Than Satisfactory	Remarks
		1 2 3	4 5 6	7 8 9	
1.	Journal based / recent advances learning				
2.	Patient based /Laboratory or Skill based learning				
3.	Self directed learning and teaching				
4.	Departmental and interdepartmental learning activity				
5.	External and Outreach Activities / CMEs				
6.	Thesis / Research work				
7.	Log Book Maintenance				

Publications **Yes/ No**

Remarks*_____
_____
_____
_____

***REMARKS: Any significant positive or negative attributes of a postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.**

SIGNATURE OF ASSESSEE **SIGNATURE OF CONSULTANT** **SIGNATURE OF HOD**

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GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR MS IN GENERAL SURGERY

Preamble:

The purpose of PG education is to create specialists who would provide high quality health care and advance the cause of science through research & training.

A post graduate specialist having undergone the required training should be able to recognize the health needs of the community, should be competent to handle effectively medical / surgical problems and should be aware of the recent advances pertaining to his specialty. The PG student should be competent to provide professional services with empathy and humane approach. The PG student should acquire the basic skills in teaching of medical / para-medical students and is also expected to know the principles of research methodology and self-directed learning for continuous professional development.

The purpose of this document is to provide teachers and learners illustrative guidelines to achieve defined outcomes through learning and assessment. This document was prepared by various subject-content specialists. The Reconciliation Board of the Academic Committee has attempted to render uniformity without compromise to purpose and content of the document. Compromise in purity of syntax has been made in order to preserve the purpose and content. This has necessitated retention of “domains of learning” under the heading “competencies”.

SUBJECT SPECIFIC LEARNING OBJECTIVES

Clinical Objectives

At the end of postgraduate training, the PG student should be able to: -

1. diagnose and appropriately manage common surgical ailments in a given situation.
2. provide adequate preoperative, post-operative and follow-up care of surgical patients.
3. identify situations calling for urgent or early surgical intervention and refer at the optimum time to the appropriate centers.
4. counsel and guide patients and relatives regarding need, implications and problems of surgery in the individual patient.
5. provide and coordinate emergency resuscitative measures in acute surgical situations including trauma.
6. organize and conduct relief measures in situations of mass disaster including triage.

7. effectively participate in the National Health Programs especially in the Family Welfare Programs.
8. discharge effectively medico-legal and ethical responsibilities and practice his specialty ethically.
9. must learn to minimize medical errors.
10. must update knowledge in recent advances and newer techniques in the management of the patients.
11. must learn to obtain informed consent prior to performance of operative procedure.
12. perform surgical audit on a regular basis and maintain records (manual and/or electronic) for life.
13. participate regularly in departmental academic activities by presenting Seminar, Case discussion, Journal Club and Topic discussion on weekly basis and maintain logbook.
14. demonstrate sufficient understanding of basic sciences related to his specialty.
14. plan and advise measures for the prevention and rehabilitation of patients belonging to his specialty.

Research:

The student should:

1. know the basic concepts of research methodology, plan a research project and know how to consult library.
2. should have basic knowledge of statistics.

Teaching:

The student should learn the basic methodology of teaching and develop competence in teaching medical/paramedical students.

Professionalism:

1. The student will show integrity, accountability, respect, compassion and dedicated patient care. The student will demonstrate a commitment to excellence and continuous professional development.
2. The student should demonstrate a commitment to ethical principles relating to providing patient care, confidentiality of patient information and informed consent.
3. The student should show sensitivity and responsiveness to patients' culture, age, gender and disabilities.

SUBJECT SPECIFIC COMPETENCIES

By the end of the course, the student should have acquired knowledge (cognitive domain), professionalism (affective domain) and skills (psychomotor domain) as given below:

A. Cognitive domain

- Demonstrate knowledge of applied aspects of basic sciences like applied anatomy, physiology, biochemistry, pathology, microbiology and pharmacology.
- Demonstrate knowledge of the bedside procedures and latest diagnostics and therapeutics available.
- Describe aetoiology, pathophysiology, principles of diagnosis and management of common surgical problems including emergencies, in adults and children.
- Demonstrate the theoretical knowledge of general principles of surgery.
- Demonstrate the theoretical knowledge of systemic surgery including disaster management and recent advances.
- Demonstrate the theoretical knowledge to choose, and interpret appropriate diagnostic and therapeutic imaging including ultrasound, Mammogram, CT scan, MRI.
- Demonstrate the knowledge of ethics, medico-legal aspects, communication skills and leadership skills. The PG student should be able to provide professional services with empathy and humane approach.

B. Affective domain

- Should be able to function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the patient and the clinician or other colleagues to provide the best possible diagnosis or opinion.
- Always adopt ethical principles and maintain proper etiquette in dealings with patients, relatives and other health personnel and to respect the rights of the patient including the right to information and second opinion.
- Develop communication skills to word reports, obtain a proper relevant history and professional opinion as well as to interact with patients, relatives, peers and paramedical staff, and for effective teaching.
- Obtain informed consent for any examination/procedure and explain to the patient and attendants the disease and its prognosis with a humane approach.
- Provide appropriate care that is ethical, compassionate, responsive and cost effective and in conformation with statutory rules.

C. Psychomotor domain

- Perform a humane and thorough clinical examination including internal examinations and examinations of all organs/systems in adults and children
- Write a complete case record with all necessary details.
- Arrive at a logical working diagnosis / differential diagnosis after clinical examination.
- Order appropriate investigations keeping in mind their relevance (need based).
- Choose, perform and interpret appropriate imaging in trauma - ultrasound FAST (Focused Abdominal Sonography in Trauma).

- Perform minor operative procedures and common general surgical operations independently and the major procedures under guidance.
- Provide basic and advanced life saving support services in emergency situations
- Provide required immediate treatment and comprehensive treatment taking the help of specialist as required.
- Perform minimally invasive surgery in appropriate clinical settings. Must have undergone basic training in operative laparoscopy related to general and GI Surgery.
- Undertake complete patient monitoring including the preoperative and post operative care of the patient.
- Write a proper discharge summary with all relevant information.

Syllabus

Course Contents:

No limit can be fixed and no fixed number of topics can be prescribed as course contents. She/he is expected to know the subject in depth, however, emphasis should be on the diseases/health problems most prevalent in that area. Knowledge of recent advances and basic sciences as applicable to his/her specialty should get high priority. Competence in surgical skills commensurate with the specialty (actual hands - on training) must be ensured.

1. General topics:

A student should have fair knowledge of basic sciences (Anatomy, Physiology, Biochemistry, Microbiology, Pathology and Pharmacology) as applied to his specialty. Further, the student should acquire in-depth knowledge of his subject including recent advances and should be fully conversant with the bedside procedures (diagnostic and therapeutic) and having knowledge of latest diagnostics and therapeutics available.

1. History of medicine with special reference to ancient Indian texts
2. Health economics - basic terms, health insurance
3. Medical sociology, doctor-patient relationship, family adjustments in disease, organizational behavior, conflict resolution
4. Computers - record keeping, computer aided learning, virtual reality, robotics
5. Hazards in hospital and protection:
   AIDS, hepatitis B, tuberculosis, radiation, psychological
6. Environment protection - bio-medical waste management
7. Surgical audit, evidence based surgical practice, quality assurance
8. Concept of essential drugs and rational use of drugs
9. Procurement of stores and material & personal management

10. Research methodology - library consultation, formulating research, selection of topic, writing thesis protocol, preparation of consent form from patients
11. Bio-medical statistics, clinical trials
12. Medical ethics
13. Consumer protection
14. Newer antibiotics
15. Problem of resistance.
16. Sepsis - SIRS
17. Nosocomial infection
18. Advances in imaging technologies
19. Disaster management, mass casualties, Triage
20. O.T. design, technologies, equipment
21. Critical care in surgical practice
22. Response to trauma
23. Wound healing
24. Fluid and electrolyte balance
25. Nutrition
26. Blood transfusion
27. Brain death
28. Cadaveric organ retrieval

1. Systemic Surgery

The student must acquire knowledge in the following important topics are but teaching should not be limited to these topics. A standard text-book may be followed, which will also identify the level of learning expected of the trainees.

- Wound healing including recent advances
- Asepsis, antisepsis, sterilization and universal precaution
- Surgical knots, sutures, drains, bandages and splints
- Surgical infections, causes of infections, prevention
- Common aerobic and anaerobic organisms and newer organisms causing infection including *Helicobacter Pylori*
- Tetanus, gas gangrene treatment & prevention
- Chronic specific infections TB, Filariasis
- Boils, cellulites, abscess, narcotizing fascitis and synergistic infection
- Antibiotic therapy rationale including antibiotic prophylaxis, misuse, abuse
- Hospital acquired nosocomial infection causes and prevention including MRSA etc.
- HIV, AIDS and Hepatitis B & C, Universal precautions when dealing with patients suffering from these diseases
- Fluid and electrolyte balance including acid – base disturbance, consequences,

interpretation of blood gas analysis data and management

- Rhabdomyolysis and prevention of renal failure
- Shock (septicaemic, hypovolaemic, Neurogenic, anaphylactic), etiology, pathophysiology and management
- Blood and blood components, transfusion indication, contraindication, mismatch and prevention and management of complications of massive blood transfusion
- Common preoperative preparation (detailed preoperative workup, risk assessment according to the disease and general condition of the patient as per ASA grade) and detailed postoperative complications following major and minor surgical procedures
- Surgical aspects of diabetes mellitus particularly management of diabetic foot and gangrene, preoperative control of diabetes, consequences of hypo- and hyper-glycaemia in a postoperative setting
- Consequences and management of bites and stings including snake, dog, human bites
- Mechanisms and management of missile, blast and gunshot injuries
- Organ transplantation: Basic principles including cadaver donation, related Human Organ Transplant Acts, ethical and medicolegal aspects.
- Nutritional support to surgical patients
- Common skin and subcutaneous condition
- Sinus and fistulae, pressure sores
- Acute arterial occlusion, diagnosis and initiate management
- Types of gangrene, Burger's disease and atherosclerosis
- Investigations in case of arterial obstruction, amputation, vascular injuries: basic principles and management
- Venous disorders: Varicose veins
- Diagnosis, principles of therapy, prevention of DVT: basic principles and management
- Lymphatic: Diagnosis and principles of management of lymphangitis and lymphedema
- Surgical management of Filariasis
- Burns: causes, prevention and management
- Wounds of scalp and its management
- Recognition, diagnosis and monitoring of patients with head injury, Glasgow coma scale
- Undergo advanced trauma and cardiac support course (certified) before appearing in final examination
- Recognition of acute cerebral compression, indication for referrals.
- Cleft lip and palate
- Leukoplakia, retention cysts, ulcers of tongue

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- Oral malignancies
- Salivary gland neoplasms
- Branchial cyst, cystic hygroma
- Cervical lymphadenitis nonspecific and tuberculous, metastatic lymph nodes and lymphomas.
- Diagnosis and principles of management of goitre
- Thyroglossal cyst and fistula
- Thyrotoxicosis
- Thyroid neoplasms
- Management of solitary thyroid nodule
- Thoracic outlet syndrome
- Management of nipple discharge
- Breast abscess
- Clinical breast examination, breast self examination
- Screening and investigation of breast lump
- Concept of Single Stop Breast Clinic
- Cancer breast diagnosis, staging and multimodality management (common neoadjuvant and adjuvant and palliative chemotherapy protocols and indications of radiation and hormonal therapy, pathology and interpretation of Tumour Markers, breast cancer support groups and counseling)
- Recognition and treatment of pneumothorax, haemothorax
- Pulmonary embolism: Index of suspicion, prevention/recognition and treatment
- Flail chest, stove in chest
- Postoperative pulmonary complication
- Empyema thoracis
- Recognition of oesophgeal atresisa and principles of management
- Neoplasms of the lung including its prevention by tobacco control
- Cancer oesophagus: principles of management including importance of early detection and timely referral to specialist
- Achalasia cardia
- Gastro-esophageal reflux disease (GERD)
- Congenital hypertrophic pyloric stenosis
- Aetiopathogenesis, diagnosis and management of peptic ulcer including role of H. Pylori and its diagnosis and eradication
- Cancer stomach
- Signs and tests of liver dysfunction
- Amoebic liver abscess and its non-operative management
- Hydatid cyst and its medical and surgical management including laparoscopic management
- Portal hypertension, index of suspicion, symptoms and signs of liver failure and

timely referral to a specialist center

- Obstructive jaundice with emphasis on differentiating medical vs surgical Jaundice, algorithm of investigation, diagnosis and surgical treatment options
- Neoplasms of liver
- Rupture spleen
- Indications for splenectomy
- Clinical features, diagnosis, complications and principles of management of cholelithiasis and cholecystitis including laparoscopic cholecystectomy
- Management of bile duct stones including endoscopic, open and laparoscopic management
- Carcinoma gall bladder, incidental cancer gallbladder, index of suspicion and its staging and principles of management
- Choledochal cyst
- Acute pancreatitis both due to gallstones and alcohol
- Chronic pancreatitis
- Carcinoma pancreas
- Peritonitis: causes, recognition, diagnosis, complications and principles of management with knowledge of typhoid perforation, tuberculous peritonitis, postoperative peritonitis
- Abdominal pain types and causes with emphasis on diagnosing early intra-abdominal acute pathology requiring surgical intervention
- Intestinal amoebiasis and other worms manifestation (Ascariasis) and their surgical complications (Intestinal Obstruction, perforation, gastrointestinal bleeding, involvement of biliary tract)
- Abdominal tuberculosis both peritoneal and intestinal
- Intestinal obstruction
- **Appendix:** Diagnosis and management of acute appendicitis
- Appendicular lump and abscess

Colon

- Congenital disorders, Congenital megacolon
- Colitis infective / non infective
- Inflammatory bowel diseases
- Premalignant conditions of large bowel
- Ulcerative colitis
- Carcinoma colon
- Principles of management of types of colostomy

Rectum and Anal Canal:

- Congenital disorders, Anorectal anamolies
- Prolapse of rectum

- Carcinoma rectum
- Anal Canal: surgical anatomy, features and management of fissures, fistula - in – ano.
- Perianal and ischiorectal abscess
- Haemorrhoids – Non-operative outpatient procedures for the control of bleeding (Banding, cryotherapy, injection) operative options - open and closed haemorrhoidectomy and stapled haemorrhoidectomy
- Anal carcinoma
- Clinical features, diagnosis, complication and principles of management of inguinal hernia including laparoscopic repair
- Umbilical, femoral hernia and epigastric hernia
- Open and Laparoscopic repair of incisional/primary ventral hernia
- Urinary symptoms and investigations of urinary tract
- Diagnosis and principles of management of urolithiasis
- Lower Urinary tract symptoms or prostatism
- Benign prostatic hyperplasia; diagnosis and management
- Genital tuberculosis in male
- Phimosis and paraphimosis
- Carcinoma penis
- Diagnosis and principles of treatment of undescendecd testis
- Torsion testis
- Hydrocele, haematocele and pyocele Varicocele: Diagnosis (Medical Board for fitness)
- Varicocele: Diagnosis (Medical Board for fitness)
- Acute and chronic epididymo-orchitis
- Testicular tumours
- Principles of management of urethral injuries
- Management of soft tissue sarcoma
- Prosthetic materials used in surgical practice
- Telemedicine, teleproctoring and e-learning
- Communication skills

A student should be expert in good history taking, physical examination, providing basic life support and advanced cardiac life support, common procedures like FNAC, Biopsy, aspiration from serous cavities, lumber puncture etc. The student should be able to choose the required investigations.

Clinical cases and Symptoms-based approach to the patient with:

1. Ulcers in oral cavity

2. Solitary nodule of the thyroid
3. Lymph node in the neck
4. Suspected breast lump
5. Benign breast disease
6. Acute abdominal pain
7. Blunt Trauma Abdomen
8. Gall stone disease
9. Dysphagia
10. Chronic abdominal pain
11. Epigastric mass
12. Right hypochrondium mass
13. Right iliac fossa mass
14. Renal mass
15. Inguino-scrotal swelling
16. Scrotal swelling
17. Gastric outlet obstruction
18. Upper gastrointestinal bleeding
19. Lower gastrointestinal bleeding
20. Anorectal symptoms
21. Acute intestinal obstruction
22. Obstructive jaundice
23. Acute retention of Urine
24. Bladder outlet obstruction
25. Haematuria
26. Peripheral vascular disease
27. Varicose veins
28. New born with developmental anomalies
29. Hydronephrosis , Pyonephrosis, perinephric abscess
30. Renal tuberculosis
31. Renal tumors
32. Carcinoma prostate
33. Genital tuberculosis in male

At the end of the course, post graduate students should be able to perform independently (including perioperative management) the following:

- Start IV lines and monitor infusions
- Start and monitor blood transfusion
- Venous cut-down
- Start and manage a C.V.P. line
- Conduct CPR (Cardiopulmonary resuscitation)

- Basic/ advance life support
- Endotracheal intubation
- Insert nasogastric tube
- Proctoscopy
- Urethral catheterisation
- Surgical management of wounds
- Biopsies including image guided
- Manage pneumothorax / pleural space collections
- Infiltration, surface and digital Nerve blocks
- Incise and drain superficial abscesses
- Control external hemorrhage
- Vasectomy (Preferably non-scalpel)
- Circumcision
- Surgery for hydrocele
- Surgery for hernia
- Surgery and Injection/banding of piles
- Management of all types of shock
- Assessment and management of burns
- Hemithyroidectomy
- Excision of thyroglossal cyst
- Excision Biopsy of Cervical Lymphnode
- Excision of benign breast lump
- Modified Radical mastectomy
- Axillary Lymphnode Biopsy
- Excision of gynaecomastia
- Excision of skin and subcutaneous swellings
- Split thickness skin graft
- Management of hernias
- Laparoscopic and open cholecystectomy
- Management of Liver abscess
- appendectomy
- Management of intestinal obstruction, small bowel resection, perforation and anastomosis
- Colostomy

The student must have observed or assisted (the list is illustrative) in the following:

- Hartmann’s procedure for cancer rectum
- Spleenectomy (emergency)
- Stomach perforation
- Varicose Vein surgery

- Craniotomy (Head Injury)
- Superficial parotidectomy
- Submandibular gland excision
- Soft tissue tumours including sarcoma
- Pancreaticoduodenal resection
- Hydatid cyst liver
- Pancreatic surgery
- Retroperitoneal operations

TEACHING AND LEARNING METHODS

Teaching methodology

Didactic lectures are of least importance; small group discussion such as seminars, journal clubs, symposia, reviews and guest lectures should get priority for theoretical knowledge. Bedside teaching, grand rounds, structured interactive group discussions and clinical demonstrations should be the hallmark of clinical/practical learning with appropriate emphasis on e-learning. Student should have hand-on training in performing various procedures and ability to interpret various tests/investigations. Exposure to newer specialized diagnostic/therapeutic procedures concerning her/his subject should be given. Self-learning tools like assignments and case-based learning may be promoted.

1. **Clinical postings**

   A major portion of posting should be in General Surgery. It should include in-patients, out-patients, ICU, trauma, emergency room and speciality clinics.

   Rotation of posting

   - Inter-unit rotation in the department should be done for a period of up to one year.
   - Rotation in appropriate related subspecialties for a total period not exceeding 06 months.

2. **Clinical meetings:**

   There should be intra- and inter- departmental meetings for discussing the uncommon /interesting cases involving multiple departments.

3. **Log book:** Each student must be asked to present a specified number of cases for clinical discussion, perform procedures/tests/operations/present seminars/review articles from various journals in inter-unit/interdepartmental teaching sessions. They should be entered in a Log Book. The Log books shall be checked and assessed periodically by the faculty members imparting the training.

4. **Thesis writing and research:**

   Thesis writing is compulsory.

5. The postgraduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.
6. A postgraduate student of a postgraduate degree course in broad specialities/super specialities would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.
7. The student should know the basic concepts of research methodology, plan a research project, be able to retrieve information from the library. The student should have a basic knowledge of statistics.
8. Department should encourage e-learning activities.

During the training programme, patient safety is of paramount importance; therefore, skills are to be learnt initially on the models, later to be performed under supervision followed by performing independently; for this purpose, provision of surgical skills laboratories in the medical colleges is mandatory.

ASSESSMENT

Assessment should be comprehensive & objective. It should address the stated competencies of the course. The assessment needs to be spread over the duration of the course.

FORMATIVE ASSESSMENT, i.e., assessment during the training would include:
Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self directed learning and ability to practice in the system.

General Principles

Internal Assessment should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills. The Internal Assessment should be conducted in theory and clinical examination.

Quarterly assessment during the MS training should be based on following educational activities:

1. **Journal based / recent advances learning**
2. **Patient based /Laboratory or Skill based learning**
3. **Self directed learning and teaching**

4. **Departmental and interdepartmental learning activity**
5. **External and Outreach Activities / CMEs**

The student to be assessed periodically as per categories listed in postgraduate student appraisal form (Annexure I).

SUMMATIVE ASSESSMENT, ie., assessment at the end of training

The summative examination would be carried out as per the Rules given in **POSTGRADUATE MEDICAL EDUCATION REGULATIONS, 2000.**

The examination will be in three parts:

1. **Thesis**

   Every post graduate student shall carry out work on an assigned research project under the guidance of a recognised Post Graduate Teacher, the result of which shall be written up and submitted in the form of a Thesis. Work for writing the Thesis is aimed at contributing to the development of a spirit of enquiry, besides exposing the candidate to the techniques of research, critical analysis, acquaintance with the latest advances in medical science and the manner of identifying and consulting available literature.

   Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination. The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination. A candidate shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners.

2. **Theory**

   The examinations shall be organised on the basis of ‘Grading’or ‘Marking system’ to evaluate and to certify candidate's level of knowledge, skill and competence at the end of the training. Obtaining a minimum of 50% marks in ‘Theory’ as well as ‘Practical’ separately shall be mandatory for passing examination as a whole. The examination for MS shall be held at the end of 3rd academic year. An academic term shall mean six month's training period.

   Theory shall consist of four papers of 3 hours each.

   Paper I: Basic Sciences

   Paper II: Principles and Practice of Surgery

   Paper III: Principles and practice of Operative Surgery

Paper IV: Recent Advances in Surgery

3. Clinical / Practical and viva voce Examination

Clinical examination shall be conducted to test the knowledge, skills, attitude and competence of the post graduate students for undertaking independent work as a specialist/Teacher, for which post graduate students shall examine a minimum one long case and two short cases.

The Oral examination shall be thorough and shall aim at assessing the post graduate student's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty, which form a part of the examination.

Assessment may include Objective structured clinical examination.(OSCE)

Oral/Viva-voce examination needs to assess knowledge on X-rays, instrumentation, operative procedures. Due weightage should be given to Log Book Records and day-to-day observation during the training.

Recommended Reading:

Books (latest edition)

1. *Text Book of Surgery*, by Christopher Davis
2. ASI Text Book of Surgery
3. *Surgery of Colon, Rectum and Anal canal*, by Goligher J C
4. Schwartz *Text Book of Surgery*
5. *Textbook on Laparoscopic Surgery*
6. *Trauma (Mattox)*
7. *Recent Advances in Surgery*
8. *Year Book of Surgery*
9. *Surgical Clinics of North America*
10. *Short practice of Surgery* by Bailey and Love
11. *A manual of clinical Surgery*, by S Das
12. Hamilton Bailey's demonstration of clinical signs
13. Pye's *Surgical Handicraft*

Journals

03-05 international Journals and 02 national (all indexed) journals

Annexure I

Postgraduate Students Appraisal Form
Pre / Para /Clinical Disciplines

Name of the Department/Unit :

Name of the PG Student :

Period of Training : FROM……TO……

Sr. No.	PARTICULARS	Not Satisfactory	Satisfactory	More Than Satisfactory	Remarks
		1 2 3	4 5 6	7 8 9	
1.	Journal based / recent advances learning				
2.	Patient based /Laboratory or Skill based learning				
3.	Self directed learning and teaching				
4.	Departmental and interdepartmental learning activity				
5.	External and Outreach Activities / CMEs				
6.	Thesis / Research work				
7.	Log Book Maintenance				

Publications **Yes/ No**

Remarks*_____
_____
_____
_____

***REMARKS: Any significant positive or negative attributes of a postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.**

SIGNATURE OF ASSESSEE **SIGNATURE OF CONSULTANT** **SIGNATURE OF HOD**

Medical Council Of India

Draft Syllabus Prepared by Sub Committee on 06/01/2014 as per meeting of BOS on 07/10/2013 & Faculty of Medicine 08/10/2013. To be Submitted to BOS on 20/03/2014 & Faculty on 21/03/2014

Final Syllabus passed by Academic Council on 21/05/2014 Item No. 28 /2014. Subject to Uniformity in the University Examination System.

FACULTY OF MEDICINE

SYLLABUS

FOR

M.D. & DDVL IN DERMATOLOGY, VENEREOLOGY AND LEPROSY

MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES

NASHIK

DERMATOLOGY , VENEREOLOGY AND LEPROSY — M D & DDVL

Dermatology including Venereology (STD) and Leprology is one of the important basic clinical speciality. Considerable advances have taken place in the understanding of dermatological disorders and their treatment. Leprosy is still a public health problem of considerable magnitude in the country. The STDs are showing worldwide increase in incidence with new dimensions added to it.
There is a dearth of trained personnel in the speciality. Very few medical college in the country impart sufficient knowledge about these diseases at Undergraduate level and Postgraduate courses are not available in all medical colleges.
The curriculum of MD Dermatology has been made designed matching the other clinical specialities at the Institute. An attempt has been made to give a comprehensive training to the postgraduates including basic subjects and recent advances.

OBJECTIVES

At the end of this training a candidate should be able to
1. Diagnose and manage independently common skin diseases, sexually transmitted diseases and leprosy.
2. Manage independently and efficiently all medical emergencies related with skin, leprosy and venereal disease.
3. Adopt preventive measures at individual and community levels against communicable skin, venereal diseases and leprosy.
4. Teach requisite knowledge and laboratory skills to other medical/paramedical team members.
5. Adopt a compassionate attitude toward towards the patients (and their families) under his/ her charge.
6. Critically evaluate and initiate investigation for solving problems relating to skin, venereal diseases and leprosy.

SKILLS TO BE LEARNT

1. History taking for dermatology, venereology and leprosy
2. Describe cutaneous findings in dermatological terms in a systematic way.
3. Evaluate and manage the common diseases in dermatology and have a broad idea how to approach an uncommon diseases.
4. Evaluate and manage STD cases
5. Evaluate and manage HIV positive cases
6. Systemic examination relevant for dermatologic condition
7. Maintain basic skills like pulse, blood pressure chest and cardiac auscultation learnt in MBBS
8. Care of dermatologic emergencies like TEN, Pemphigus, necrotic ENL, angioedema, drug reactions etc.
9. Management of pediatric cases with skin diseases
10. To achieve adequate skills for tests done in side laboratory in day-to-day practice and be familiar with other sophisticated investigations.

Fundamentals of Cutaneous Diagnosis-

Basic skin lesions, history taking, examination of the patient including relevant diagnostic, clinical tests and aids.

Duration of Course –

Full Time: 3 Academic Years for PG Degree Course and Full Time 02 Academic Years for Diploma course.

SYLLABUS

Topics Related to Allied Basic Sciences

The structure, function and development of human skin. Skin as a barrier
Ultra structural aspects of epidermis, epidermal appendages, dermoepidermal junction, dermis, and sub-cutis
Immunology, Molecular biology and genetics in relation to the skin.
Epidermal cell kinetics and Keratinization
Lipids of epidermis and sebaceous glands
Percutaneous absorption
Biology of eccrine and apocrine sweat glands
Biology of hair follicles, sebaceous glands and nails
Biology of melanocytes and melanin formation
Disorders of keratinisation
Epidermal proteins
Dermal connective tissue : collagen, elastin, reticulin, basement membrane and ground substance
Metabolism of carbohydrates, proteins, fats and steroids by the skin
Cutaneous vasculature and vascular responses
Mechanism of cutaneous wound healing
Cellular and molecular biology of cutaneous inflammation
Immunoligic aspects of skin
HLA system, Immunoglobulins, cyto kines
Complement system
Hyper-sensitivity and allergy
Cutaneous carcinogenesis
Basic of cutaneous bacteriology, mycology, virology, parasitology and defence mechanism.
Common laboratory procedures, stains culture media and related serological tests
Basic pathologic reaction pattern in skin
Common and special histopathological stains and procedures used in the diagnosis of skin diseases and Special techniques such as immunofluorescence, immunoperoxidase and other related techniques.

Clinical Dermatology

Epidemiology of cutaneous diseases
Pyschologic aspects of skin disease and psycho-cutaneous disorders
Pathophysiology and clinical aspects of pruritus.

Papulo-squamous Diseases

Psoriasis, Pityriasis rubra pilaris, pityriasis rosea Licen Planus, lichenoid eruptions
Parapsoriasis, Palmoplantar Keratodermas.
Darier.s disease. Prorokeratosis
Ichthyoses and ichthyosiform dermatoses, Keratodermas

Vesiculo-bullous Disorders

Pemphigus group of disorders
Bullous pemphigiod

Chronic bullous disease of childhood
Familial benign pemphigus
Herpes gestationis
Mechanobullous (hereditary and acquired)
Epidermolysis bullosa acquisita
Dermatitis herpetiformis
Erythema Multiforme
Subcorneal pustular dermatoses

Disorders of Epidermal Appendages

Disorders of hair and nails
Disorders of sebaceous glands : Acne
Rosacea, Perioral dermatitis,
Disorders of eccrine and apocrine sweat glands

Tumours

Naevi and hamartomas
Precancerous Skin lesions, Squamous cell carcinoma and Basal cell carcinoma, malignant melanoma.
Pagets disease, Keratoacanthoma.
Benign epithelial tumours, appendageal tumours

Disorders of pigmentation

Vitiligo Albinism, Benign neoplasia and hyperplasias of melanocytes, Dyplastic melanocytic nevi, hyperpigmentation

Inflammatory Disorders of the Dermis

Acute Febrile Neutrophilic dermatosis
Erythema elevatum diutinum
Cutaneous eosinophilic diseases
Granuloma faciale
Pyoderma grangrenosum
Erythema annulare centrifugum and other Figurate Erythemas
Granuloma annulare
Malignant atrophic papulosis
Neoplasms, Pseudo neoplasms and Hyperplasias of the Dermis
Vascular Anomalies, Kaposi.s Sarcoma
Anetoderma and other Atrophic Disorders of the skin
Neoplasias and hyperplasias of Neural and Muscular origin
Elastosis Perforans Serpiginosa, Reactive Perforating Collagenosis, Kyrle.s disease

Lymphomas, Pseudolymphomas and Related Conditions

Disorders of Subcutaneous Tissue

Panniculitis
Lipodystrophy
Neoplasms of the subcutaneous Fat

Disorders of the Mucocutaneous Integument.
Biology and disorders of oral mucosa
Disorders of anogenitalia of males and females

Cutaneous changes in disorders of altered reactivity

Genetic Immunodeficiency Disease
Urticaria and Angioedema
Disorders associated with complement abnormalities
Graft-versus-Host Disease
Muco-cutaneous manifestations in immunosuppressed host other that HIV-infection
Contact Dermatitis
Auto sensitization dermatitis
Atopic dermatitis (Atopic Eczema)
Nummular eczematous dermatitis
Seborrhoeic dermatitis
Vesicular plamoplantar eczema
Erythrodermas

Skin Changes Due to Mechanical and Physical Factors

Occupational skin disease
Radiobiology of the skin.
Skin problems in amputee.
Sports Dermatology.
Skin problems in war field.
Decubituls ulcers.
Radiation to the skin
Skin diseases due to cold, heat

Photobiology of skin

Normal reaction to ultra violet rays and sun exposure

Disorders Due to Drugs and Chemical Agents

Erythema multiformae, Stevens-Jhonson syndrome, toxic epidermal necrolysis and
Cutaneous reactions and mucocutaneous reactions to chemicals and drugs
Pathological response to UVR and sun exposure
Cutaneous manifestations of drug Abuse

Abnormal vascular response

Erythemas including annular erythemas
Urticaria
Vasculitis

Dermatology and age of man

Ageing of skin
Neonatal dermatological problems
Pediatric and adolescent problems
Geriatric dermatological problems

Skin Lesions in nutritional, heritable and metabolic disorders

Cutaneous Changes in nutritional disorders.
Acrodermatitis enteropathica and zinc deficiency disorders.
Cutaneous Changes in errors of amino acid metabolism

Porphyrias
Xanthomas
Disorders of lipid metabolism and storage
Mucinosis
Amyloidosis
Angiokeratoma corpris diffusum
Lipid proteinosis
Malabsorbtion
Vitamin and mineral deficiency and excess

Skin Manifestations of systemic disorders

Skin and disorders of the alimentary tract
Hepatobiliary system and the skin
Cutaneous changes in renal disorders, cardiovascular, pulmonary
disorders and endocrinal disorders
Skin changes in pregnancy
Cutaneous changes in haematological disease (Langerhans Cells and other cutaneous histiocytosis, Mastocytoses Syndrome)
Cutaneous changes in endocrine disorder
Flushing and carcinoid syndrome.

Genodermatosis

Phacomatosis
Tubero sclerosis
Incontinentia pigmentation
Ectodermal dysplasia
Xeroderma pigmentosis

Connective tissue disorder and Skin manifestations of rheumatological diseases

- Reiter's syndrome.
- Arteritis and venulitis.
- Lupus erythematosus
- Dermatomyositis
- Scleroderma
- MCTD (Mixed connective Tissue Disorders)
- Relapsing polychondritis
- Rheumatoid arthritis, rheumatic fever and gout
- Sjogren.s syndrome
- Raynaud.s phenomenon
- Multicentric reticulohistiocytosis

Cutaneous Manifestations of Disease in Other Organ Systems

Sarcoidosis of the skin
Cutaneous Manifestations of Internal Malignancy
Acanthosis Nigricans
Papular Mucinosis
Neurocutaneous Disease
Tuberous Sclerosis Complex
Neurofibromatosis
Ataxia Telangiectasia
Behect.s Disease

Bacterial infections

Pyodermas : Staphylococcus aureus, Streptococcus, and others
Staphylococcal scalded-skin syndrome
Soft tissue infections : Erysipelas, Cellulitis
Systemic bacterial infections with cutaneous manifestations
Cutaneous tuberculosis and atypical mycobacterial infections
Actinomycetoma

Fungal infections

Superficial fungal infection : (dermatophytosis, yeast, others)
Deep fungal infections

Viral and rickettsial infections

Herpes simplex virus infections
Varicella . zoster infection
Human papilloma virus
Molluscum contagiosum
Hepatitis B, C
Rubella
Measles

Parasitic and protozoal infestations

Scalries
Pediculosis.
Arthropods and skin.

THERAPEUTICS

Topical Therapy

Pharmacokinetics and topical applications of drugs
Principles of topical therapy, topical formulations

Topical Agents
Glucocorticoids, analgesics, anesthetics, antinflammatory, anti microbial, anti parasitic, antiperspirants, antipruritic, antiviral, astringents, bleaching agents, keratolytics and keratoplastic agents.
Therapies, antiviral, topical antibiotics, topical antifungal agents, sunscreens, cytotoxic agents, retinoids, Vit D3 analogues, cosmetics and skin care in practice, emollients and moisturizer.

Systemic Therapy
Systemic glucocorticoids, antibiotics, antileprosy and antituberculous agenst, sulfones, aminoquinolines, cytotoxic and antimetabolic agents, oral retinoids, antihistamines, antiviral drugs, oral antifungal agents, immunosuppressive and immunomodulatory drugs, thalidomide. Antiparasitic drugs, antiandrogens, interferons, biologics, intravenous immunoglobulins, antiplatelet agents, psychotropic agents. other misc. systemic drugs

Dermatosurgery including Cosmetic dermatology
Local aneasthesia and nerve blocks, electrosurgery/ cautery, vitiligo surgeries, cryotherapy, electrolysis, tattooing, intra-lesional injections, iontophoresis, dermabrasion, biopsy techniques, hair and nail minor surgeries, excision surgeries.
Lasers in dermatology - for vascular, hair and pigmented disorders.

Skin resurfacing : chemical peels
Skin resurfacing : dermabrasion
Skin resurfacing : Laser
Skin punch grafting
Wound dressings
Sclerotherapy for varicose and telangiectatic veins
Botulinum injections.
Tumescent liposuction
Substances for soft tissue augmentation
Hair transplantation and alopecia reduction
Cryosurgery
Mohs micrographic surgery
Nail surgery

Photochemotherapy and Photo therapy including principles and use of Narrow band UVB, PUVA, UVB in Skin diseases.

STD
Clinical approach to the patient with STD
Anatomy of male and female genitalia
Epidemiology of STD's
Human Sexuality.
Viral STD.s including HIV, HSV, HPV, Molluscum contagiosum, EBV etc.
Bacterial STD.s : Syphilis, gonorrhoea, chancroid, donovanosis, bacterial vaginosis
Chlamydial and mycoplsma infections : Lymphogranuloma venereum, urethritis, cervicits, NGU
Fungal : Candidiasis
Protozoal : Trichomoniasis
Ectoparasitic : scabies, pediculosis infestations.
Syndromic management of STD.s
STD.s in reproduction health and paediatrics
STD.s and HIV
Post exposure prophylaxis
Prevention, counseling and education of different STD.s including HIV
National control programmes of STDs and HIV infection
Medicolegal, social aspects of STD.s including psychological and behavioural abnormalities in STD patients.

Management of Antiretroviral Therapy of Adults and Adolescents.
- Diagnosis of HIV Infection in Adults and Adolescents.
- Assessment of Adults and Adolescents with HIV Infection and pre- ART Care and Follow-up.
- Prophylaxis of Opportunistic Infections.
- ART in Adults and Adolescents.
- Routine Monitoring of Patients on ART.
- ART in pregnant Women, PPTCT and Previous Exposure to NVP.
- Considerations for Co-infection with HIV.
- Antiretroviral Drug Toxicity.
- ART Treatment Failure and When to Switch.
- Choice of ARV Regimens in the Event of Failure of First-line Regimens.
- Nutritional Aspects of HIV.
- Palliative Care in HIV.
- NACO Standardized Reporting and Recording System.

Management of Occupational Exposure including Post-exposure Prophylaxis.
Cutaneous Manifestation and Lab-diagonasis of HIV.
Prevention aspect of STD's (Condoms, Vaccines etc).
Prevention, counseling and education of different STD.s including HIV
National control programmes of STDs and HIV infection

Medicolegal, social aspects of STD.s including psychological and behavioural abnormalities in STD patients

LEPROSY

Approach to the patient with leprosy
Epidemiological aspects
Structure, biochemistry, microbiology of Mycobacterium leprae
Animal models
Pathogenesis
Classification
Immunology and molecular biological aspects
Histopathology and diagnosis including laboratory aids
Clinical features
Reactions
Systemic involvement (ocular, bone, mucosa, testes and endocrine etc.)
Pregnancy and leprosy
HIV infection and leprosy
Therapeutic aspects including newer drugs
Immunotherapy,
Disabilities, deformities and rehabilitation
Prevention, education and counseling
National leprosy control and elimination programme

DIPLOMA IN VENEREOLOGY AND DERMATOLOGY PRACTICAL/ CLINICAL EXAMINATION :-

Sr. No.	Heads	Marks
1	One Long Case	80
2	Two Short Cases	30×2=60
3	Viva	80
4	Spotters Ten	5×10=50
5	Histopath Slides	3×10=30
Total Marks	**300 Marks**	

Subheads to be added to Draft Syllabus for MD and DDVL

Basics of Dermoscopy and Trichoscopy

Cosmetic Dermatology
Chemical Peels,
Lasers,
Botox and fillers,
Facial rejuvenation

Continuing Medical Education:

1) University should sponsor CMEs to be held by rotation in each of the medical colleges affiliated to the university on the subjects of (or related subjects)
    a. Dermatopathology
    b. Dermoscopy
    c. Skin in internal medicine
    d. Genodermatoses
    e. Autoimmune diseases
    f. Contact Dermatitis
    g. Ultraviolet therapy
    h. Vitiligo
    i. Pigmentary diseases
    j. Leprosy

2) Faculty development:

    a. Faculty training: Each of the medical college departments may be identified as a training centre for one or two subspecialties mentioned above. Faculty from other medical colleges interested in getting trained in that department for that subject should be given the opportunity to attend the training for one to two weeks on deputation from their department under a university program. Faculty may also be encouraged to acquire experience in related fields by attending part time at an allied department in the same hospital.

    b. Foreign Conferences - leave and support: Each senior faculty (Professor and Associate Professor), should be given 5 days leave once a year to attend a conference or training abroad. Financial assistance for such travel may be given if the faculty is invited to present a paper at the conference.

3) Books and journals: Currently students and teachers are unaware of the availability of digital resources provided by MUHS. Awareness drive should be held to improve visibility of this vital resource. Students should be given a handout of the facilities at the time of registration.

    a. The number of books and journals provided in the MUHS digital library should be increased. I recommend the following additional journals:
        Indian Journal of Dermatology
        International Journal of Dermatology
        Indian Journal of Sexually Transmitted Infections and AIDS
        Journal of American Academy of Dermatology
        Journal of European Academy of Dermatology and Venereology

INTRODUCTION

EM specialist is the first Doctor whom the patient meets on entering the hospital. The kind of care patient receives in the ER becomes the mirror of the quality of the service for the patient in the rest of the hospital. The EM specialist has to appreciate the importance of the Platinum minutes and Golden Hour to minimize morbidity and mortality.

The EM specialist has to tackle

1. **Acute problems**
2. **Mass Casualties**
3. **Agonized patients and relatives**
4. **Medico- legal issues**

The patient spends first few minutes or hours only in the ER. The aim of this course is to train the Medical Graduate in the field of Emergency Medicine. Knowledge & practical skills shall be acquired by the candidates in various specialties so that the candidate will be competent & confident to manage all types of cases attending the Emergency room. He will be given special training of soft skills like

1. **Communication skill**
2. **Crowd management**
3. **Breaking a bad news**
4. **Stress management for self & the patient's relatives**
5. **Management of Stressful situation**
6. **Social Problems**

They should be well versed with all types of EM equipments. They will be trained in emergency ultrasound. They will be trained in basic research methodology so as to enable them to conduct fundamental & applied research. They will be trained in teaching methods so that they can take teaching assignments.

GOALS

To transform the medical graduate into an all rounder who can handle all kinds of emergencies effectively.

Educational Objectives

To empower the EM student with knowledge, skill and tools required to handle the ER.

This will require

- **Medical skills as well as**
- **Soft skills and**
- **Equipment handling**

Soft Skills

- **Cognitive and psychomotor skills**
- **Empathy**
- **Stress management for self as well as patient's relatives.**
- **Management of stressful situations**
- **Communication skills (e.g. Breaking bad news)**
- **Medico-Legal knowledge and skills**
- **Social skills**

CURRICULUM

The curriculum is based on the primary text book of emergency medicine: A Comprehensive Study Guide 9th edition edited by J .E. Tintinalli. In addition, Rosen's Emergency Medicine Concepts and Clinical Practice. Clinical Procedures in emergency medicine by J.R.Roberts & Jerris Hedges will be used to teach the procedures in EM .

The core curriculum for 3-year postgraduate training program in Emergency Medicine

Cardiovascular Diseases
Cardiopulmonary resuscitation
Basic life support (one and two-rescuer CPR)
Advanced life support
Recognition of cardiac rhythms during cardiac arrest
Use of drugs
Defibrillation
Pacing
Leadership during CPR
Choking victim
Neonatal/pediatric CPR
CPR during pregnancy
Chest pain
Stable angina
Acute coronary syndromes (unstable angina, ST-elevation and Non-STelevation myocardial infarction)
Use of thrombolytics
Use of glycoprotein inhibitors in ED
Angioplasty vs. thrombolytics
Pulmonary embolism
Aortic dissection
Congestive heart failure and pulmonary edema
Palpitations
Cardiac arrhythmias
Tachyarrhythmias
Narrow complex vs. broad complex
Electric cardioversion
Anti-arrhythmic drugs
Bradyarrhythmias
Hypertensive urgencies and emergencies
Temporary and permanent cardiac pacemaker
Shock
Hemorrhagic shock
Cardiogenic shock
Neurogenic shock
Septic shock
Anaphylactic shock
Blood/blood products
Cardiovascular drugs
Fluids
Vasopressors
Deep vein thrombosis
Valvular heart diseases
Stuck artificial cardiac valve
Infective endocarditis
Acute pericarditis and cardiac tamponade
Acute myocarditis
Acute rheumatic fever
Vascular access
Peripheral vascular disease
Sudden cardiac death
Cardiac transplant patient
Airways management and Anesthesia
Principle of airway management
including difficult airway management
Rapid sequence intubation
Pain management
Procedural sedation
Regional, local and general anesthesia
Ventilator management
Trauma
Trauma resuscitation
Primary survey
Secondary survey
Advanced trauma life support
Transfer arrangements
Wound management:
Lacerations
Abrasions
Contusion
Puncture wounds
Principles of management
Control of local bleeding
Suturing
General
Specific sites
Local anesthesia
Head and facial trauma
Head injury
Fractures of bones of face
Facial injuries
Dental injuries
Nasal injuries
Ear injuries
Oral cavity injuries
Temporomandibular joint dislocation
Spinal trauma
Immobilization
Examination
Cervical
Dorsal
Lumbar
Chest trauma
Blunt/penetrating
Tension pneumothorax
Cardiac tamponade

Massive hemothorax
Open chest wound
Ruptured aorta
Flail chest
Contusion lung
Emphysema
Abdominal trauma
Blunt/penetrating trauma
FAST
Diagnostic peritoneal lavage
Ultrasound and CT
Pelvic trauma
Genitourinary trauma
Pelvic fracture
Extremity trauma
Skeletal trauma (fractures)
Dislocation
Vascular trauma
Soft tissue trauma (strains and
sprains)
Hand trauma
Compartment syndrome
Degloving injuries
Amputation/reimplantation
Fat embolism
Trauma in children
Trauma during pregnancy
Trauma in elderly
Blast injuries
Mass casualties and injury care
Respiratory emergencies
Dyspnea
Respiratory failure and ARDS
Hemoptysis
Acute severe asthma / COPD
Pneumothorax
Foreign body
Pneumonia and chest infections
Thermal/chemical injury to lungs
Sleep apnea syndrome
Gastrointestinal and Hepatic emergencies
Abdominal pain
Acute abdomen
Acute gastritis
Cholangitis, cholecystitis
Acute pancreatitis
Acute appendicitis
Perforation/peritonitis
Mesenteric ischemia
Renal pain
Intestinal obstruction
Paralytic ileus
Inflammatory bowel disease
Vomiting and diarrhoea
Evaluation of dehydration
Fluid therapy
Acute GI bleed
Upper GI bleed
Lower GI bleed
Foreign body ingestion
Acute volvulus
Hemorrhoids
Rectal prolapse
Perirectal abscess
Hernias
Ascites
Acute liver failure
Cirrhosis and its complications
Liver abscess
Jaundice
Liver transplant patient
Onco-haematological emergencies
Acute bleeding (including hemophilia)
Disseminated intravascular coagulation
Use of antithrombotic and antiplatelet agents
Febrile neutropenia
Thrombocytopenia
Severe anemia
Acute hemolysis
Superior vena cava syndrome
Tumour lysis syndrome
Cord compression
Metastatic emergencies
Blood/blood products and transfusion
Stem cell and bone marrow transplantation
Non-traumatic orthopedic emergencies
Orthopedic and neurovascular examination of extremities
Acute osteomyelitis
Acute arthritis
Acute gout
Prosthesis-related emergencies
Acute back pain
Acute neck pain
Acute shoulder pain
Hand and foot infections
Joint infections and inflammations
Muscle and tendon infections and inflammation
Genitourinary emergencies
Nephrolithiasis
Acute renal failure
Acute retention of urine
Sexual assault
Complications of chronic kidney disease
Hematuria
Torsion of testis
Sexually transmitted diseases
Epididymitis/orchitis/prostatitis
Obstructive uropathy
Acute pyelonephritis and perinephric abscess
Phimosis and paraphimosis
Foreign body insertion
Kidney transplant patient
Rheumatological emergencies
Acute vasculitis
Anti-phospholipid antibody syndrome
Rheumatologic disorders involving vital organs
Kawasaki’s syndrome
Ocular emergencies
Red eye

Conjunctivitis
Acute glaucoma
Uveitis
Ocular emergencies (cont.)
Trauma
Foreign body
Corneal abrasión
Hyphema
Blow-out fracture
Chemical burns
Visual loss/impairment
Orbital cellulitis
CNS emergencies
Headache
Approach
Specific disorders (including migraine)
Syncope, vertigo and dizziness
Seizures
Epileptic seizures
Pseudoseizures
Status epilepticus
Coma and neurological impairment
Metabolic coma
Hypoglycemia
Ketoacidosis
Hyperosmolar coma
Hepatic encephalopathy
Neurological coma
Meningitis and encephalitis
Acute stroke
Ischemic
Hemorrhagic
Transient ischemic attack
Subarachnoid hemorrhage
Cavernous sinus thrombosis
Compressive and non-compressive myelopathies
Peripheral neuropathy (including LGB syndrome)
Myasthenic crisis
Cranial nerve palsies
Infections
HIV in emergency department
Malaria (complicated and uncomplicated)
Leptospirosis
Enteric fever
Chicken pox and herpes zoster
Measles/mumps
Dengue and other hemorrhagic fevers
Chikungunya
Evaluation of fever in Emergency Department
Acute hepatitis
Disseminated tuberculosis
Management of needlestick injury
Tetanus
Infections (cont.)
Rabies
Diphtheria/Pertussis
Cholera
Food poisoning
Polio
Plague
Toxic shock syndrome
Gas gangrene and other anerobic infections
Sexually transmitted diseases
Influenza
Fever
Immunization
ENT emergencies
Upper airway obstruction and stridor
Epistaxis
Acute tonsillitis/sore throat/acute laryngitis
Foreign bodies
Acute suppurative otitis media and externa
Acute sinusitis
Other infections
Dermatological emergencies
Exfoliative dermatitis
Steven Johnson syndrome
Toxic epidermal necrolysis
Skin infections, inflammation and allergies
Gynecology and Obstetrics emergencies
Ectopic pregnancy
Lower abdominal pain
Vaginal bleeding
Abortion
Pre-eclampsia/Eclampsia
Conduct of delivery
Emergency contraception
Rape victim
Amniotic fluid embolism
Pediatric emergencies
Advanced pediatric life support
Neonatal advanced life support
Care of newborn
Croup/epiglottitis
Asthma
Fever (neonate, young infant, older infant, child)
Septicemia
Meningitis
Seizures
Congenital heart diseases
Non-cardiac congenital diseases
Pediatric emergencies (cont.)
Pain relief
Dehydration
Care of pre-term baby
Drug therapy in newborns, infants and children
Child abuse
Drugs in pediatric emergencies
Metabolic and Endocrine emergencies
Diabetic emergencies:

Hypoglycemia
Hyperosmolar hyperglycemic state
Keoacidosis
Fluid and electrolyte abnormalities
Normal physiology
Hypovolemia
Hyper/Hyponatremia
Hyper/hypokalemia
Hyper/hypocalcemia
Acid-base disturbances
Hypopituitarism/Hypoadrenalism
Thyrotoxic crisis and myxedema coma
Acute toxicology
Initial management
Recognition of toxidromes
Antidotes
Insecticides and pesticides
Drug overdose
Snake bites, and scorpion and insect
stings
Plant poisoning
Kerosene oil poisoning
Ethyl alcohol poisoning and withdrawal
Other alcohols (methyl alcohol,
ethylene glycol)
Methemoglobinemia
Hyperthermias
Substance abuse
Hazardous chemicals
Metal poisoning
CBRN disasters
Poison control centers
Environmental emergencies
Burns
Smoke inhalation
Lightening
Electric burns
High altitude illnesses
Diving emergencies
Cold-induced illnesses
Heat-induced illnesses
Near-drowning
Animal and human bites
Geriatric emergencies
Psycho-social assessment
Mobility assessment
Drug pharmacology
Geriatric abuse
Psychiatric emergencies
Thought and mood disorders
Anxiety and somatiform disorders
Self-harm
Delirium, dementia and psychosis
Suicide and homicide
Alcohol and substance abuse
IV drug abuse
Sexual assault and child abuse
Domestic violence and elder abuse
Violence in the ED
Disaster medicine
Definitions
Disaster planning
Medical response to terrorist incidents
Miscellaneous
Pre-hospital care
Forensic aspects
Medico-legal examination
Examination of rape accused
Wound examination
Bullet wounds
Types of injuries (simple, grievous,
dangerous)
Signs of death
Biostatistics
Research methodology
Imaging techniques:
Plain x-rays
Ultrasound and echocardiography
CT
MRI
Angiography
Interventional techniques
Nuclear medicine in emergencies
Ethical issues

PROCEDURAL SKILLS

Airway management and cervical spine control
Wound management
Wound preparation
Wound closure techniques
Debridement
Dressing techniques
Removal of foreign bodies
Tendon repair
Orthopedic emergency procedures
Splinting/immobilization
Spinal immobilization
Limb splinting
Logrolling
Helmet removal
Fasciotomy
Reduction of dislocations
Traction splints
Plaster techniques for various fractures
Joint aspiration
Cervical collar application
Pelvic stabilization techniques
Local and regional anesthesia
Conscious sedation and analgesia
Ear, nose and throat procedures
Indirect larngoscopy
Nasal packing
Removal of foreign bodies
Maxillo-facial techniques
Dental anesthesia
Dental socket suture
Ocular techniques
Slit lamp
Foreign body removal
Gynaecological and Obstetrics:
Delivery
Speculum examination

Others
Reducing paraphimosis
Nasogastric tube insertion
Incision and drainage of abscess
Nerve blocks
Detorsion of torsion of testis
Transportation of patients
Intra-hospital
Inter-hospital
Communication skills
Patients and relatives
Colleagues and other personnel
Bereavement
Ultrasonography and echoardiography (both diagnostic and therapeutic)
Designing a research study
Interpretation of laboratory investigations/plain X-rays/CT/MRI
Major incident planning
Basic airway management (opening airway by various methods)
Bag mask ventilation
Advanced airway management
Tracheal intubation
Alternative procedures (non-surgical and surgical)
Pediatric airway management
Neonatal airway management
Cardiopulmonary resuscitation
Basic
Advanced
Electric therapy
Cardioversion/defibrillation
Cardiac pacing

ECG interpretation
Ventilator management
Basic trauma management and Advanced Trauma Life Support (non-Orthopedics)
Intercostal chest tube
Needle thoracentesis
Surgical and needle cricothyroidotomy
Suprapubic catheterization
Central venous access
Suture technique
Arterial puncture
Nasal packing
Foreign body removal
Foley's catheterization
Needle and tube thoracotomy (in penetrating chest injuries) and aortic clamping
Pulmonary procedures
Invasive ventilation principles
Thoracentesis
Needle/tube thoracostomy
Cardiovascular procedures
Cardiac compression
Central venous access
Subclavian vein
Jugular vein
Femoral vein
Arterial access
Cut down techniques
Intra-osseous access
CVP monitoring
Pericardiocentesis
Monitoring
Decontamination procedures
Gastric lavage
Skin/eye decontamination
Paracentesis
Neurological
Lumbar puncture
Burr hole

LIST OF PROCEDURES ALONG WITH MINIMUM NUMBER TO BE PERFORMED INDEPENDENTLY

Procedure	Numbers to be performed independently.
Airway management (opening airway by various methods)	100
Bag mask ventilation	100
Tracheal intubation	100
Alternative airway management methods (non-surgical andsurgical)	25
Pediatric and neonatal airway management	35
Cardiopulmonary resuscitation	50
Cardioversion/defibrillation	40
Cardiac pacing	10
Ventilator management	50
Intercostal chest tube	10
Needle thoracentesis	10
Suprapubic catheterization	05
Central venous access	50
Suturing (various techniques)	100
Arterial puncture	100
Cut down	10
Intraosseous access	10
CVP monitoring	10
Ultrasound and echocardiogram	40 normal and 60 abnormal with various emergency conditions equally represented
Nasal packing	10
Foley's catheterization	50
Paracentesis	10
Pericardiocentesis	10
Wound care	100
Splint application for various fractures	100
Spinal immobilization	10
Reduction of dislocations	20
Plaster techniques for various fractures	50

Cervical collar application	10
Pelvic stabilization	05
Local and regional anesthesia	50
Conscious sedation and analgesia	10
Nerve blocks	10
Slit lamp examination	20
Delivery	10
Lumbar puncture	10
Burr hole	05
Reducing paraphimosis	05
Nasogastric tube insertion	50
Incision and drainage of abscess	50
Analysis of plain X-ray films	200
Analysis of CT scans	20

LECTURES

Lecture 1: Pre-Hospital care

Lecture 2 & 3: Disaster Management

Lecture 4-8: Resuscitation

Lecture 9-12: Resuscitative Procedures

Lecture 13: Analgesia Anesthesia Procedural Sedation

Lecture 14-15: Wound management

Lecture 16-19: Cardiovascular (Add a EKG Lecture : One hour More)

Lecture 20-23: Gastrointestinal

Lecture 24-25: Renal & Genitourinary

Lecture 26-28: Obstetrics & gynecology

Lecture 29-34: Pediatrics

Lecture 35-36: Infectious Diseases

Lecture 37-40: Central Nervous System

Lecture 41-48: Toxicology

Lecture 49-53: Environment

Lecture 54-55: Endocrine

Lecture 56-58: Hemato-oncology

Lecture 59-61: ENT

Lecture 62-63: Dermatology (Add Skin Pictures lecture: One Hour More)

Lecture 64-68: Trauma (Add CT/MRI Lecture one Hour More)

Lecture 69-73: Orthopedics (Add X-ray Lecture: One Hour More)

Lecture 74-76: Musculoskeletal

Lecture 77-78: Psychiatry

Lecture 79-80: Abuse Assault Special Situations

Total lectures 84/year

Minimum 2 per lectures/ week based on the above schedule. And at end of lectures 10 MCQ will be submitted by Residents to Faculty to be put in bank. Once a month test from Monthly lectures. 10 Short answer questions in each test.

INTERDICIPLINARY LECTURES FROM OTHER DEPARTMENT FACULTY

32 Exam Interdisciplinary Topics so that Standard Orders and Protocols can be built with other departments.

1. ARDS: ICU

2. Pediatric Sepsis: PICU

3. Ventilation Strategies: Anesthesia

4. Abdominal Compartment Syndrome: ICU

5. Complex Metabolic Management: Anesthesia

6. Complex ABG Management: Anesthesia

7. Intracerebral Hemorrhage Traumatic V/S Non Traumatic: Neurosurgery

8. Complex Management of Seizures in Pediatric and Adults: Neurology

9. Eclampsia in Pregnancy: Obstetrics & gynecology

10. Aortic TAA/ TAD/ AAA Emergencies: CVTS

11. Thrombolytic and Anticoagulation in Emergency Situations

12. Priapism: Urology

13. Exchange Transfusions in Pediatrics and Adults: Hematology

14. Management of Acute on Chronic Renal Failure in EM: Nephrology

15. Hemorrhagic Fevers: Internal Medicine

16. Fever in Immunocompromised subjects: Internal Medicine

17. Right Ventricular Infarction: Cardiology

18. Learning about Pacemaker and its emergencies: Cardiology

19. Meningitis and its recognition and interpretation of LP :Traumatic v/s non

traumatic in adults

20. Meningitis and its recognition and interpretation of LP :Traumatic v/s non

traumatic in adults

21. Fractures which needs to go to OR Stat: Orthopedics

22. Advances in Stroke: Neurology

23. Rationale use of Antibiotics: Microbiology

24. Bleeds in Hemophiliacs in Pediatrics and Adults

25. Vascular Trauma; Dissections (Other than aorta): CVTS

26. Which Radiology Test what indication: Radiology

27. Standard Orders in DKA NKHHC: Endocrinology

28. Treating K/Ca/Na/Mg Disorders: Standard Orders

29. Status Epilepticus: Neurology

30. Status Asthamaticus: Chest & T.B.

31. Documentation Pearls to avoid litigation

32. High Risk EM REVIEW

PGP

The schedule for Post Graduate Program includes

1. Once a week Seminar
2. Once a week Journal class
3. Once a week Clinico-pathological correlation
4. Once a week Case presentation
5. Twice weekly lectures by faculty
6. Once a month Death Audit
7. Grand round daily
8. Integrated teaching once in 3 months
9. Statistical Meeting once a month

ROTATION

Year I

Emergency Department: 7 months
Orthopedic & wound care: 2wks
PSM – 2 weeks
SICU - 1 month
MICU-1 month
Ophthalmology/ENT- 2wks/2wks
Anaesthesia-1 month

Year II

Emergency Department: 7 months
OBG – 1 month
Pediatric ward – 2 weeks
Psychiatry – 2 wks
PICU- 1 month
Neurology/Nephrology- 2 weeks each
Pediatric EM: 1 month
Neurosurgery – 2 weeks

Year III

Emergency Department: 7 months
Trauma - 1 month
Dermatology – 1 month
FMT – 2 weeks
Radiology & Ultrasound- 2 wks
Administration (EM Services)-1 month
Elective- 1 month

GOALS OF ROTATION

Anesthesia

- Develop airway management skills
- Develop familiarity with pharmacological agents used in anesthesia
- Learn standard monitoring techniques
- Learn ventilator management
- Learn relevant pre-operative historical and physical exam considerations
- Learn principles of pain management.

Emergency Medicine

Develop the ability to rapidly evaluate, diagnose, stabilize, and disposition of critically ill patients.

- Learn respiratory, cardiovascular, renal and neurologic physiology and the pathophysiology of trauma, toxins, shock, sepsis, cardiac failure, and respiratory failure that affect critically ill patients.
- Learn the principles of medical instrumentation and hemodynamic monitoring and be able to utilize them in the care of critically ill patients.
- Learn the indications and develop the technical skills needed to perform diagnostic and therapeutic interventions in critically ill patients.
- Learn the rational use of laboratory, radiographic and other diagnostic tests in the management of critically ill patients.
- Understand the etiologies and pathophysiology of cardiac arrest.
- Learn to recognize the dysrhythmias associated with cardiac arrest and their treatment.
- Learn the American Heart Association (AHA) recommendations and develop skill in the performance of standard resuscitative procedures.
- Learn the principles of pharmacotherapy and the routes and dosages of drugs recommended during cardiac arrest and following resuscitation.
- Learn the indications for withholding and terminating resuscitation.
- Learn common organizational structures of emergency medical services.
- Learn the pathophysiology, patient evaluation and management of thermal and chemical burns.
- Learn the pathophysiology, patient evaluation and management of electrical injury, including lightning injury.
- Learn the pathophysiology, patient evaluation and management of radiation injuries.
- Learn the pathophysiology, patient evaluation and management of hypothermia and frostbite.
- Learn the pathophysiology, patient evaluation and management of heat illness.
- Learn the pathophysiology, patient evaluation and management of drowning and near-drowning.
- Learn the pathophysiology, patient evaluation and management of high altitude illness.
- Learn basic ethical principles relevant to emergency medicine.
- Learn basic legal principles relevant to emergency medicine.

- Learn the overall principles of managing the geriatric patient in an emergency care environment.
- Learn basic statistics and research methodologies
- Learn the presenting signs, symptoms, laboratory findings, pathophysiology and treatment of common therapeutic drug poisonings, drugs of abuse, natural toxins, and general household poisons as delineated in the core curriculum of Emergency Medicine
- Learn the common hazardous materials (HAZMAT) of the workplace and prehospital operations with regard to HAZMAT incidents.
- Learn use of the diagnostic imaging modalities available for the evaluation of orthopedic disorders.
- Develop skill in the diagnosis and treatment of inflammatory and infectious disorders of the musculoskeletal system.
- Learn principles of acute and chronic pain management in patients with musculoskeletal disorders.
- Master the understanding of the components of the immune system, and the disorders of hyper and hypofunction of the immune system.
- Know the major systemic infectious disorders, their diagnosis and treatment.
- Develop knowledge of the etiologies, manifestations, and treatment of endocrine and metabolic disorders.
- Develop familiarity with common general surgical disorders presenting to Emergency, and develop relevant history and physical exam skills.
- Develop procedural skills relevant to general surgery.
- Learn indications for consultation and surgical intervention in patients with acute abdominal pain.
- Learn the principles of trauma management including ATLS.
- Learn how CSF shunts function and learn to evaluate patients with possible shunt malfunction.

Dermatology

- Develop ability to recognize and appropriately treat disorders of the skin and mucous membranes.

Forensic Medicine

- Learn basic principles of medico-legal cases
- Learn various types of wounds
- Learn medico-legal aspects of gunshot wounds
- Learn preservation of various samples for medico-legal purpose.

General Medicine

- Assimilate general concepts of Internal Medicine, history taking and physical examination skills to develop a systematic evaluation for patients presenting to the emergency department.
- Learn the pathophysiology, presentation, and management of diseases related to the alimentary tract.

- Develop knowledge of the pathophysiology, presentation, and management of common hematologic diseases.
- Master the understanding of the components of the immune system, and the disorders of hyper- and hypofunction of the immune system.
- Know the major systemic infectious disorders, their diagnosis and treatment.
- Learn the pathophysiology, evaluation, and treatment of renal disorders.
- Develop knowledge of the etiologies, manifestations, and treatment of endocrine and metabolic disorders.
- Master the understanding of the diseases of the respiratory system, including pathophysiology, evaluation, and treatment.
- Learn management of upper and lower gastrointestinal bleed
- Learn management of acute hepatic failure
- Learn management of complications of cirrhosis
- Learn about acid-base and electrolyte disturbances
- Perform peritoneal dialysis
- Learn about complications of dialysis and renal failure
- Demonstrate the ability to stabilize patients who present in cardiopulmonary arrest.
- Develop skills in the evaluation of patients who present with chest pain.
- Demonstrate the ability to evaluate, stabilize, treat, and arrange for appropriate disposition of patients with cardiac disease processes.
- Demonstrate the ability to develop a differential diagnosis for patients presenting with cardiac symptomatology (chest pain, shortness of breath, weakness, palpitations), etc.
- Demonstrate skill in the interpretation of diagnostic modalities (ECG, chest x-ray and cardiac ultrasonography).
- Develop familiarity with cardiac pharmacologic agents.
- Demonstrate skill at cardiac related procedures: venous line and CVP pressure monitoring, pericardiocentesis, defibrillation and cardioversion, Swan Ganz catheterization, and ultrasonography.
- Demonstrate the ability to diagnose, stabilize, and apply thrombolytic therapy to patients presenting with acute myocardial infarction.
- Learn the anatomy, pathophysiology, presentation, and management of common nervous system disorders.
- Develop skill in the performance of a screening and detailed neurological evaluation.
- Develop skill in the use and performance of diagnostic procedures in the evaluation of neurological disorders

General Surgery including Trauma

- Develop familiarity with common general surgical disorders.
- Develop relevant history and physical examination skills.
- Develop procedural skills relevant to general surgery.
- Develop skill in the overall assessment of the general surgical patient.
- Learn indications for consultation and surgical intervention in patients with acute abdominal pain.
- Learn the principles of care of the preoperative patient.

- Learn the anatomy, pathophysiology, presentation, and management of common nervous system injuries.
- Develop skill in the performance of screening and detailed neurological evaluation.
- Develop skill in the use and performance of diagnostic procedures in the evaluation of neurological injuries.
- Effectively utilize radiologic studies to diagnose neurological injuries.
- Diagnose, stabilize and provide initial treatment of injuries of the brain, spinal cord, bony spine and peripheral nerves.
- Learn how CSF shunts function and learn to evaluate patients with possible shunt malfunction.
- Learn about special aspects of trauma in children
- Learn surgical emergencies in children
- Learn the relevant history and physical examination skills.
- Learn the use of diagnostic imaging modalities available for the evaluation of urologic disorders.
- Learn the diagnosis and management of urinary tract infections, including pyelonephritis and prostatitis.
- Learn the diagnosis and management of renal calculi.
- Learn the evaluation and management of renal and genitourinary trauma.
- Learn the diagnosis and management of disorders of the male genitalia.

Obstetrics/Gynecology

- Learn the principles of contraception.
- Develop expertise in the diagnosis and management of emergent complications of pregnancy.
- Develop expertise in the management of uncomplicated and complicated labor and delivery.
- Develop expertise in the management of sexual assault.
- Learn the principles of management of gynecologic and obstetrical trauma.
- Learn diagnosis and treatment of genital and pelvic infectious diseases.
- Develop expertise in the diagnosis and management of abdominal pain in females.
- Develop expertise in the diagnosis and management of vaginal bleeding.

Ophthalmology

Develop relevant history and physical examination skills

- Learn to recognize and treat emergent causes of visual loss
- Learn the principles of ocular trauma management
- Learn the evaluation and management of common ophthalmologic complaints.

Orthopedics

- Develop relevant history and physical examination skills.
- Learn use of the diagnostic imaging modalities available for the evaluation of orthopedic disorders.
- Develop skill in the evaluation and management of musculoskeletal trauma.

- Develop skill in the diagnosis and treatment of inflammatory and infectious disorders of the musculoskeletal system.
- Learn principles of acute and chronic pain management in patients with musculoskeletal disorders.
- Learn principles trauma care.
- Develop an organized approach to the assessment, resuscitation, stabilization and provision of definitive care for the trauma victim.
- Learn use of the diagnostic imaging modalities available for evaluation of the trauma victim.
- Develop procedural skills necessary in the evaluation and management of the trauma victim.
- Learn to recognize and treat immediate life and limb threatening injuries in the trauma victim.
- Learn special considerations in the evaluation and management of the pregnant trauma victim.
- Learn special considerations in the evaluation and management of the pediatric trauma victim.
- Learn special considerations in the evaluation and management of the geriatric trauma victim.
- Learn the principles of disaster management
- Learn how to manage fractures, reduce dislocations and learn the splint and plaster techniques

Otolaryngology

- Develop relevant history and physical examination skills.
- Learn the evaluation and management of common problems of the head and neck.
- Learn the evaluation and management of facial trauma.
- Develop skill in the evaluation and management of upper airway disorders.
- Learn use of the diagnostic imaging modalities available for evaluation of head and neck disorders.

Pediatrics

- Develop skill in infant/pediatric resuscitation.
- Develop skill in performance of appropriate pediatric history and physical examination, including general growth and development, assessment and knowledge of current immunization requirements.
- Learn the etiologies, significance, and treatment of fever and infection in the child.
- Learn the manifestations and significance of abdominal related complaints in the child.
- Learn the etiologies and treatment of neurologic emergencies in the child.
- Learn the physiology and management of derangements of fluid and electrolyte in children.
- Learn the indications of social and/or psychological disturbances.
- Learn the specific problems of pediatric trauma victims.
- Learn the manifestations and treatment of pediatric cardiac abnormalities.

- Learn the pathophysiology, etiologies, and treatment of respiratory disorders of children.
- Learn the pathophysiology, etiologies, and treatment of common serious endocrine and hematologic disorders of children.
- Learn the pathophysiology, etiologies, and treatment of common serious gynecologic and urologic conditions of children.
- Learn to recognize and provide appropriate treatment for orthopedic and soft tissue problems of childhood.
- Learn the common dermatologic diseases and dermatologic manifestations of systemic diseases in children.
- Learn to recognize and treat children with common and/or serious problems of the head and neck.

Psychiatry

- Develop familiarity with common psychotherapeutic agents.
- Learn relevant interviewing techniques to deal with patients with various psychiatric disorders.
- Learn principles of managing the violent patient.

Radiology

- Learn all the possible presentations of injuries and clinical conditions with theirrelated radiological findings in CT Scan, X-Ray and MRI, Ultrasound, etc.

Elective

Upgrade any area of deficient expertise

Community Medicine –

- Learn management of emergencies in the community setting

COMPETENCIES TO BE ATTAINED BY THE END OF 3 YEARS

By the end of their first year, emergency medicine residents will:

1. Demonstrate the ability to provide appropriate care to patients with non-emergent problems:
    a. Obtain an accurate and complete clinical and psychosocial history and perform a comprehensive physical examination
    b. Develop appropriate differential diagnoses
    c. Know the available investigative and therapeutic options
    d. After review, implement an appropriate investigative and therapeutic plan
    e. Develop and, after review, implement an appropriate written and verbal discharge plan
    f. Demonstrate an awareness of the available information systems to support patient care and discharge planning
    g. Demonstrate competency (including an understanding of the indications, contraindications, and techniques) in the core procedures used on nonemergent patients (e.g. laceration repair, reduction in or immobilization of extremity
    h. injury, pelvic examination, slit-lamp examination)
    i. Demonstrate an understanding of the concepts of disease prevention as it
    j. applies to emergency medicine
    k. Properly document all historical, physical examination, and diagnostic test findings
2. Demonstrate a level-appropriate knowledge of the biochemical, clinical, epidemiologic, and social-behavioural basis of diseases seen in the emergency department:
    a. Demonstrate a basic understanding of the principles of evidence-based medicine
    b. Demonstrate mastery of minor acute and nonemergent conditions
    c. Demonstrate mastery of the principles of ACLS and ATLS d. PALS and NALS (paediatric advanced life support and neonate advanced life support)
    d. Demonstrate a level-appropriate understanding of the core curriculum
3. Demonstrate the ability to appraise and assimilate scientific evidence and analyze and improve their own practice:
    a. Demonstrate the ability to critically assess their competency in managing minor acute and on emergent cases
    b. Demonstrate the ability to apply published studies to their own practice
    c. Demonstrate the ability to use available information technology appropriate to the care of their patients
4. Demonstrate effective interpersonal and communication skills with:
    a. Patients and their families
    b. Other physicians
    c. Other health care providers
5. Demonstrate the professionalism required of a physician:
    a. Accept responsibility for continuity of patient care
    b. Demonstrate respect for patients' privacy and autonomy
    c. Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities
    d. Demonstrate a commitment to sound ethical principles regarding the care of patients

e. Demonstrate respect for the dignity of patients and colleagues as persons

6. Demonstrate a basic understanding of the role of the emergency department in the larger context of health care delivery:
   a. Demonstrate an understanding of the principles of a cost-benefit analysis
   b. Know the relative costs of the various tests and treatment contemplated
   c. Serve as an advocate for the patient in their dealing with the complexities of the health care system, specifically with regard to appropriate referral and followup

By the end of their second year, residents will, in addition to the objectives achieved during the first year:

1. Demonstrate the ability to provide appropriate care to patients with emergent and life threatening conditions:
   a. Obtain an appropriately focused history and perform an appropriately focused physical examination
   b. Develop comprehensive differential diagnoses
   c. Develop an investigative and therapeutic plan
   d. Develop and, after review, implement an appropriate written and verbal discharge plan
   e. Demonstrate competency (including an understanding of the indications, contraindications, and techniques) in the core procedures used on patients with emergent and life-threatening conditions (eg, endotracheal intubation, tube thoracostomy, defibrillation/cardioversion, etc.)
2. Demonstrate a level-appropriate knowledge of the biochemical, clinical, epidemiologic, and social-behavioural basis of diseases seen in the emergency department:
   a. Apply the principles of evidence-based medicine
   b. Demonstrate mastery of the emergent and life-threatening conditions that present to the emergency department
   c. Demonstrate a level-appropriate understanding of the core
3. Demonstrate the ability to appraise and assimilate scientific evidence and analyze and improve their own practice:
   a. Demonstrate the ability to critically assess their competency in managing the emergent and life-threatening conditions that present to the emergency department
   b. Use published studies to improve their own practice
   c. Use available information technology appropriate to the care of their patients
4. Demonstrate a level-appropriate understanding of the role of the emergency department in the larger context of health care delivery:
   a. Demonstrate the ability to divide his or her time and energies appropriately to provide optimal care for several patients concurrently
   b. Develop plans for evaluation and treatment that, without compromising patient care, acknowledge the patient's particular health care system

By the end of their third year, residents will, in addition to the objectives achieved during the first 2 years:

1. Demonstrate the ability to provide appropriate care to patients

a. Listen to a history and physical examination presentation from a junior resident and provide appropriate feedback and guidance
b. Perform an appropriately focused history and physical examination, taking into consideration the previous evaluation of the junior resident
c. Implement an appropriate investigative and therapeutic plan
d. Implement an appropriate written and verbal discharge plan
e. Demonstrate understanding of the indications, contraindications, and techniques in uncommonly performed but lifesaving procedures (eg, cricothyroidotomy, burr craniotomy) and mastery of all other core procedures
f. Demonstrate an understanding of documentation as it applies to billing and reimbursement requirements

2. Demonstrate a level-appropriate knowledge of the biochemical, clinical, epidemiologic, and social-behavioural basis of diseases seen in the emergency department:
   a. Demonstrate mastery of all conditions that commonly present to the emergency department
   b. Teach courses such as ACLS as a certified instructor
   c. Demonstrate an understanding of the core curriculum
3. Facilitate the learning of others
   a. Teach and appropriately supervise medical students and junior residents
4. Demonstrate an understanding of the role of the emergency department in the larger context of health care delivery
   a. Triage patients and direct the attention of junior-level residents so as to provide optimal care for all patients in the emergency department.
   b. Plan and participate in a mass-casualty disaster drill

PROGRESS REPORT FORMAT

(Affiliated to Maharashtra University of Health Sciences)

Term-wise Progress Report of
Post Graduate Residents

Department of : _____

Part – I

(Students Profile)

1. Name of P. G. Resident : _____
2. Name of the PG Course : _____
3. Year of admission : _____
4. Term : From _____to _____
5. Dissertation Topic : _____

   (for Degree Course Only) _____

   _____
6. Name of P.G. Guide : _____
7. Name of the H.O.D. : _____

8. Leave availed during the : _____

period

9. Total percentage of attendance: _____

Part – II

Assessment according to Clinical/Academic Performance

Grading	A	-	Above 80%
	B	-	60% to 80%
	C	-	50% to 59%
	D	-	Less than 50%

(1) CLINICAL PERFORMANCE (Grading):

(i) O.P.D. Work : _____

_____

(ii) Ward Work : _____

(iii) O.T. Work : _____

_____

(iv) Other : _____

_____

(2) PROGRESS OF DISSERTATION (Wherever applicable):

_____
_____
_____

(3) ACADEMIC PERFORMANCE:

(i) Written Tests:-

Date	Marks obtained

(ii) *Seminar/Symposia:-

Date	Topic	Evaluation

(iii) *Case Presentation:-

Date	Topic	Evaluation

(iv) *Journal Club:-

Date	Topic	Evaluation

(v) Practical /Viva:-

Date	Marks obtained

(vi) *Microteaching:-

Date	Topic	Evaluation

(*May be assessed on a scale of 1 to 10)

(4) Papers/Posters Presented:-

Sr. No.	Title of Presentation	Paper/ Poster	Event	Month/ Year	Venue

Overall Grading: _____

Remarks of Post-Graduate Guide

Certified that Dr. _____ has a total attendance of ___ % (For duration _____ to _____). His/her overall performance has been _____(satisfactory/average/unsatisfactory)

Date: Name & Signature of PG Guide

Remarks of Head of Department

Progress of Dr. _____ has been _____ (Satisfactory / Unsatisfactory)

Date: Name & Signature of HOD

Remarks of Dean

(a) Progress _____ (Satisfactory / Unsatisfactory)

(b) Term granted _____ (Yes / No)

Date: Signature of Dean

WORKSHOPS

The Students shall complete following workshops during the first year

- BLS
- ACLS
- ATLS
- PALS
- NALS
- AUTLS
- Disaster Management
- Behavioral Sciences

DISSERTATION

AIM

To Orient the students to various methodologies of research, induce them to get acquainted with them and facilitate fruitful research, which will add to existing body of knowledge in the field of Emergency Medicine.

Objectives

- Identify a relevant research question
- Conduct critical review of literature
- Formulate a hypothesis
- Determine most suitable study design
- State the objectives of the study
- Prepare a study protocol
- Get approval from the Ethics Committee
- Conduct the study, compile the data
- Analyze & interpret the data
- Draw conclusions, declare results
- Write two research papers and publish in peer reviewed journal
- Present paper/ poster at state/ national level conference

Guidelines

- Scope of the study should be such that it is possible to conduct within the resources & time available
- More emphasis should be given on methodology rather than results
- Ethical issues & consideration must be given priority.

EVALUATION OF STUDENTS FOR PG DEGREE

For Postgraduate Degree the overall evaluation of the students will consist of internal assessment and the university examinations at the end of the course.

Internal Assessment

Once a month theory 10 Short answer questions tests as per the lectures

Viva exams once in two months at the end of rotation**.**

Titles Of Theory Papers

Paper – I Basic Sciences

Paper – II Medicine &Allied Subjects

Paper - III Surgery & Allied Subjects

Paper - IV Recent Advances

Each theory paper – 100 marks

10 Structured questions of 10 marks each – 100 marks

Practical

Ten short cases	30 marks each	300 Marks
Viva – Voce	Table Viva	100 Marks

(Equipment, X-ray/CT/MRI, ECG, ABG, BLS & ACLS,ATLS, Airway and Intubation, Ventilator, Dissertation, Communication skills, 5 OSCE of 2 mark each)

Log Book

MD Emergency Medicine

Certificate

This is to certify that Dr_____has completed six terms of residency in the Department of Emergency Medicine as a post graduate student. The student has himself / herself performed the practical work as mentioned in this log book.

Date: Signature of HOD

Place: Pune

* Indicates name & LOGO will change as per the institute.

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PersonalDetails

Title:

Surname:

Name:

Gender: Date of Birth :

Medical Council Number and Date of Issue :

Address for Correspondence :

Telephone Number:

E-Mail:

Details of MBBS:

1. College:
2. University:
3. Year of passing:

I certify that this is a true and recent likeness of the candidate.

_____

Signature of Guide

_____

Name and Dept
Stamp of H.O.D

ExplanatoryNotes

Introduction

Emergency Medicine' is a Specialty approved by the Medical Council of India. Training in this specialty is specified by MCI & National Curriculum, and Maharashtra University of Health Sciences and this will lead to the achievement of the Certificate of Completion of Post Graduate Specialty Training in Emergency Medicine.

Training in the specialty of Emergency Medicine is based on both summative and continuous formative assessments. The summative component includes the examinations as specified within the university curriculum. The formative component consists of a series of appraisals which each trainee is expected to undergo during all stages of training. These forms of assessment are used throughout the training period; however, the choice of clinical cases used during the assessments will aim to reflect the competencies expected to have been acquired at each stage reached, and will therefore become increasingly complex as the trainee progresses through each phase of the training programme.

The logbook for trainees in Emergency Medicine will serve both as a guide of the curriculum as well as a portfolio of appraisals and assessments. Each trainee, in higher training, is obliged to use this logbook. The documentation it contains will provide the proof that all competencies necessary for progress and for the eventual award of Post Graduate Degree has been completed.

Educational and Academic Activities: These include prerequisite courses such as BLS & ACLS or equivalent, ATLS or equivalent and PALS or equivalent. Participation in any other courses, conferences, specialty updates, academic meetings and journal clubs should also be recorded in this section.

Tutorials: These are scheduled teaching sessions with approved tutors and will cover various topics from the curriculum.

Case Sheets: This section will contain lists of interesting clinical problems encountered, learning points and interventions performed. These lists will highlight the experience gained by the trainee with respect to topics mentioned in the University and National Curriculum.

Work Place Based Assessments (WPBA): These assessments will provide feedback to trainers and trainees and are intended to be formative. They aim to test skills, knowledge, behavior and work attitudes during day-to-day practice. It is not possible to cover the whole curriculum through these assessments but the more important skills and topics are chosen to facilitate further exploration and discussion. Through these assessments the trainee can chart his / her progress and learn from feedback provided by the assessor.

The trainee must complete a preset number of each of the agreed types of assessments and competence is evaluated annually by the appointed tutor. Although the main workplace assessment is formative, summative evidence will be used during the annual review and this will contribute to the result of this evaluation. A minimum of one WPBA per month is recommended, but more may be required for particular trainees to ensure competence. The number of WPBA's completed may not necessarily mean that competence at a particular level has been achieved.

Types of WPBAs to be used

- Multi source feedback (MSF)
- Mini Clinical Evaluation Exercise (Mini-CEX)
- Case Based Discussion (CBD)
- Direct Observation of Procedural Skills (DOPS)

Multi Source Feedback (MSF)

This is a method of assessment of professional competence within a team-working environment and can also provide feedback to the trainee. MSF is undertaken annually by both Basic and Higher Specialty Trainees.

Mini-Clinical Evaluation Exercise (Mini-CEX)

This is a method of assessment of skills essential for the provision of a good standard of clinical care, and will also facilitate feedback to the trainee. Both the clinical and professional skills of the trainee are assessed while working in the Emergency Department or during rotations in other Departments. The assessments are based on clinical problems in a range of clinical settings. The way a trainee interacts with a patient is also observed and assessed. Most encounters last between 15 and 20 minutes.

The areas of competence covered are listed according to the stage of training reached in a separate section of this logbook. The Post Graduate should have a minimum of 4 mini CEXs per year.

Direct Observation of Procedural Skills (DOPS)

This is used to assess the trainees' technical, operative and professional skills in a range of basic diagnostic and interventional procedures, or parts of procedures, during routine practice and will facilitate developmental feedback. DOPS is used in simpler environments and procedures and can take place in the Emergency Department, wards or in the operating theatre. Lists of procedures that can be assessed in this manner are referenced later on in this document according to the level of training. A Post Graduate needs to undergo a minimum of 4 DOPS per year of training

Case Based Discussion (CBD)

This method is designed to assess clinical judgment, decision-making and the application of medical knowledge in relation to patient care in cases for which the trainee has been directly responsible. The method is particularly designed to test higher order thinking and synthesis as it allows assessors to explore deeper understanding of how trainees compile, prioritize and apply knowledge.

By using clinical cases that offer a challenge to the trainee, rather than routine cases, the trainee is able to explain the complexities involved and the reasoning behind choices they made. It also enables the discussion of the ethical and legal framework of practice. It uses patient records as the basis for dialogue, for systematic assessment and structured feedback. As the actual record is the focus for the discussion, the assessor can also evaluate the quality of record keeping and the presentation of cases. Most assessments take no longer than 15-20 minutes. The Post Graduate must complete 4 CBD per year.

Educational and Academic Activities

Mandatory Courses:

	Date	Location
BLS		
ATLS		
ACLS		

Other Courses, Conferences, Specialty Updates, Journal clubs:

Activity	Date	Location

Tutorial Sheet

Date	Tutorial Topic	Tutor signature

Interestingcases

Date	Patient ID	Clinical Problems	Interventions	Learning Points

Interestingcases

Date	Patient ID	Clinical Problems	Interventions	Learning Points

Interestingcases

Date	Patient ID	Clinical Problems	Interventions	Learning Points

Interestingcases

Date	Patient ID	Clinical Problems	Interventions	Learning Points

Interestingcases

Date	Patient ID	Clinical Problems	Interventions	Learning Points

Interestingcases

Date	Patient ID	Clinical Problems	Interventions	Learning Points

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Date	Patient ID	Clinical Problems	Interventions	Learning Points

Interestingcases

Date	Patient ID	Clinical Problems	Interventions	Learning Points

Interestingcases

Date	Patient ID	Clinical Problems	Interventions	Learning Points

Interestingcases

Date	Patient ID	Clinical Problems	Interventions	Learning Points

Interesting cases

Date	Patient ID	Clinical Problems	Interventions	Learning Points

MINI-CLINICAL EVALUATION EXERCISE (CEX)

Trainee's Surname: _____

Trainee's Forename: _____

Registration Number: _____

Clinical Setting: A&E /Clinic/ Ward/ Acute Admission

Complexity of Case (Please Circle) Low High Med

Assessors Position (Please Specify) _____

Number Of Times Procedure Performed By the Trainee: (Please Circle)

0 1-4 5-9 >9

Please grade the following areas using scale heading as appropriate	Below Expectations	Border line	Meets Expectations	Above Expectations	U/C*
History Taking					
Physical examination Skills					
Communication Skills					
Clinical judgment					
Professionalism					
Organization/Efficiency					
Overall Clinical Care					

U/C – Please mark this if you have not observed the behavior and therefore feel unable to comment

Key Learning Points	**Discussion with trainer**

Assessor's satisfaction with Case Based Discussion

- Not at all satisfied / reasonably satisfied / very satisfied

Assessors Name: _____ Signature: _____ Date: _____

MINI-CLIN MINI-CLINICAL EVALUATION EXERCISE (CEX)

Trainee's Surname: _____

Trainee's Forename: _____

Registration Number: _____

Clinical Setting: A&E /Clinic/ Ward/ Acute Admission

Complexity of Case (Please Circle) Low High Med

Assessors Position (Please Specify) _____

Number Of Times Procedure Performed By the Trainee: (Please Circle)

0 1-4 5-9 >9

Please grade the following areas using scale heading as appropriate	Below Expectations	Border line	Meets Expectations	Above Expectations	U/C*
History Taking					
Physical examination Skills					
Communication Skills					
Clinical judgment					
Professionalism					
Organization/Efficiency					
Overall Clinical Care					

U/C – Please mark this if you have not observed the behavior and therefore feel unable to comment

Key Learning Points	**Discussion with trainer**

Assessor's satisfaction with Case Based Discussion

- Not at all satisfied / reasonably satisfied / very satisfied

Assessors Name: _____ Signature: _____ Date: _____

MINI-CLINICALEVALUATIONEXERCISE(CEX)

Trainee'sSurname:

_____

Trainee'sForename:_____

_____

ComplexityofCase(PleaseCircle) Low High Med

AssessorsPosition(PleaseSpecify)_____

NumberOfTimesProcedurePerformedBytheTrainee:(PleaseCircle)

0 1-4 5-9 >9

Please grade the following areas using scale heading as appropriate	Below Expectations	Border line	Meets Expectations	Above Expectations	U/C*
History Taking					
Physical examination Skills					
Communication Skills					
Clinical judgment					
Professionalism					
Organization/Efficiency					
Overall Clinical Care					

U/C – Please mark this if you have not observed the behavior and therefore feel unable to comment

Key Learning Points	**Discussion with trainer**

Assessor's satisfaction with Case Based Discussion

- Not at all satisfied / reasonably satisfied / very satisfied

Assessors Name: _____Signature:_____Date:_____

MINI-CLINICALEVALUATIONEXERCISE(CEX)

Trainee'sSurname:

_____

Trainee'sForename:_____

_____

ComplexityofCase(PleaseCircle) Low High Med

AssessorsPosition(PleaseSpecify)_____

NumberOfTimesProcedurePerformedBytheTrainee:(PleaseCircle)

0 1-4 5-9 >9

Please grade the following areas using scale heading as appropriate	Below Expectations	Border line	Meets Expectations	Above Expectations	U/C*
History Taking					
Physical examination Skills					
Communication Skills					
Clinical judgment					
Professionalism					
Organization/Efficiency					
Overall Clinical Care					

U/C – Please mark this if you have not observed the behavior and therefore feel unable to comment

Key Learning Points	**Discussion with trainer**

Assessor's satisfaction with Case Based Discussion

- Not at all satisfied / reasonably satisfied / very satisfied

Assessors Name: _____Signature:_____Date:_____

MINI-CLINICALEVALUATIONEXERCISE(CEX)

Trainee'sSurname:

_____

Trainee'sForename:_____

_____

ComplexityofCase(PleaseCircle) Low High Med

AssessorsPosition(PleaseSpecify)_____

NumberOfTimesProcedurePerformedBytheTrainee:(PleaseCircle)

0 1-4 5-9 >9

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MINI-CLINICALEVALUATIONEXERCISE(CEX)

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ComplexityofCase(PleaseCircle) Low High Med

AssessorsPosition(PleaseSpecify)_____

NumberOfTimesProcedurePerformedBytheTrainee:(PleaseCircle)

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DIRECTOBSERVATIONOFPROCEDURALSKILLS(DOPS)

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Aseptic technique					
Seeks help where appropriate					
Post procedure management					
Communication skills					
Consideration of patient / professionalism					
Overall ability to perform procedure					

U/C:Pleasemarkthisifyouhavenotobservedthebehaviorandthereforeunabletocomment

Comments

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AssessorsName:_____Signature:_____

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DIRECTOBSERVATIONOFPROCEDURALSKILLS(DOPS)

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CASEBASEDDISCUSSION(CBD)

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ComplexityofCase(PleaseCircle) Low High Med

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NumberOfTimesProcedurePerformedBytheTrainee:(PleaseCircle)

0 1-4 5-9 >9

Please grade the following areas using scale heading as appropriate	Below Expectations	Border line	Meets Expectations	Above Expectations	U/C*
Clinical record keeping					
Clinical assessment (includes diagnostic skills)					
Medical Treatment					
Investigations & Treatment					
Follow up & Management Plan					
Clinical Reasoning					
Overall Clinical Care					

U/C – Please mark this if you have not observed the behavior and therefore feel unable to comment

AgreedAction:

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AssessorsName:_____Signature:_____

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CASEBASEDDISCUSSION(CBD)

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ComplexityofCase(PleaseCircle) Low High Med

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NumberOfTimesProcedurePerformedBytheTrainee:(PleaseCircle)

Key Learning Points	0	1-4	5-9	>9	Discussion with trainer

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AssessorsName:_____Signature:_____

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AssessorsPosition(PleaseSpecify)_____

NumberOfTimesProcedurePerformedBytheTrainee:(PleaseCircle)

Key Learning Points	0	1-4	5-9	>9	Discussion with trainer

AgreedAction:

Assessor'ssatisfactionwithCaseBasedDiscussion

- Notatallsatisfied /reasonablysatisfied /verysatisfied

AssessorsName:_____Signature:_____

Date:_____

CASEBASEDDISCUSSION(CBD)

Trainee'sSurname:

_____T

rainee'sForename:_____

_____

ComplexityofCase(PleaseCircle) Low High Med

AssessorsPosition(PleaseSpecify)_____

NumberOfTimesProcedurePerformedBytheTrainee:(PleaseCircle)

0 1-4 5-9 >9

Please grade the following areas using scale heading as appropriate	Below Expectations	Border line	Meets Expectations	Above Expectations	U/C*
Clinical record keeping					
Clinical assessment (includes diagnostic skills)					
Medical Treatment					
Investigations & Treatment					
Follow up & Management Plan					
Clinical Reasoning					
Overall Clinical Care					

U/C – Please mark this if you have not observed the behavior and therefore feel unable to comment

AgreedAction:

Assessor'ssatisfactionwithCaseBasedDiscussion

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AssessorsName:_____Signature:_____

Date:_____

CASEBASEDDISCUSSION(CBD)

Trainee'sSurname:

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rainee'sForename:_____

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AssessorsName:_____Signature:_____

Date:_____

Multi-Source Feedback

First Year

Second Year

Third Year

Work Place Based Assessment

First Year

Assessment	1	2	3	4
Mini CEX	Above Expectations As Expected Below Expectations	Above Expectations As Expected Below Expectations	Above Expectations As Expected Below Expectations	Above Expectations As Expected Below Expectations
DOPS	Above Expectations As Expected Below Expectations	Above Expectations As Expected Below Expectations	Above Expectations As Expected Below Expectations	Above Expectations As Expected Below Expectations
CBD	Above Expectations As Expected Below Expectations	Above Expectations As Expected Below Expectations	Above Expectations As Expected Below Expectations	Above Expectations As Expected Below Expectations

Second Year

Assessment	1	2	3	4
Mini CEX	Above Expectations As Expected Below Expectations	Above Expectations As Expected Below Expectations	Above Expectations As Expected Below Expectations	Above Expectations As Expected Below Expectations
DOPS	Above Expectations As Expected Below Expectations	Above Expectations As Expected Below Expectations	Above Expectations As Expected Below Expectations	Above Expectations As Expected Below Expectations
CBD	Above Expectations As Expected Below Expectations	Above Expectations As Expected Below Expectations	Above Expectations As Expected Below Expectations	Above Expectations As Expected Below Expectations

Third Year

Assessment	1	2	3	4
Mini CEX	Above Expectations As Expected Below Expectations	Above Expectations As Expected Below Expectations	Above Expectations As Expected Below Expectations	Above Expectations As Expected Below Expectations
DOPS	Above Expectations As Expected Below Expectations	Above Expectations As Expected Below Expectations	Above Expectations As Expected Below Expectations	Above Expectations As Expected Below Expectations
CBD	Above Expectations As Expected Below Expectations	Above Expectations As Expected Below Expectations	Above Expectations As Expected Below Expectations	Above Expectations As Expected Below Expectations

List of Abbreviations

BST	Basic Specialist Trainee
CBD	Case Base Discussion
DOPS	Direct Observation of Procedural Skills
HST	Higher Specialist Trainee
Mini-CEX	Mini Clinical Observation Exercise
MSF	Multi-Source Feedback
WPBA	Work Place Based Assessment

NOTES:

M.D. ANAESTHESIA - SYLLABUS

May - 2006

At the end of three years of training as residents in anaesthesia, the candidates should be fully conversant with theory and practical aspects of:

A. **Human Anatomy and Physiology of** various organ systems and cellular components in relation to Anaesthesia including muscles, neuromuscular junction, nerve plexuses, cardiovascular, respiratory, neurological, hepatobiliary, renal, endocrine and temperature homeostasis, theories of mechanism of production of anaesthesia, changes during pregnancy, various tests/investigations to evaluate the functional status of organ systems as applied to Anaesthesia Management, Intensive Care Practice and Pain Relief

B. **Pharmacology** as applied to Anaesthesia, Intensive Care Practice and Pain Relief including General Pharmacological Principles, Pharmacokinetics and Pharmacodynamics of Anaesthetic Drugs (including Uptake and Distribution of Inhaled Anaesthesia agents and All the Adjuncts used in Anaesthesia, Drugs used for treatment of various Diseases and Drug Interaction

C. **Pathophysiology of various diseases** including disorders of cardiovascular, respiratory, neurological, hepatobiliary, renal, endocrine and immune systems, various tests/investigations to grade/measure the disease process of various organ systems as applied to anaesthesia management, intensive care practice and pain relief

D. **Medicine** as applied to the practice of Anaesthesia including diagnosis and management of Diabetes, Hypertension, Bronchial Asthma, Chronic Obstructive Pulmonary Diseases, Respiratory Failure, ARDS, Myocardial Ischemia / Infarction, Arrhythmia, Shock, Congestive Heart Failure, Acute / Chronic Renal Failure, Head Injury, Unconscious patients, Status Epilepticus / Asthmaticus, Endocrine Disorders, Diseases related to Dysfunction of Hepatobiliary, Muscular, Connective Tissues and Immune system, Management of Perioperative Infection, Neuromuscular Disorders, Poisoning etc. and interpretation of ECG / Blood Gases / Other Biochemical Values and Function Tests

E. **Physics** as applied to Anaesthetic gases, vapours, anaesthesia machine, breathing systems, monitors, ventilators, therapeutic devises & other relevant equipment including physical principles involved in their construction and functioning

F. **Perioperative Anaesthesia management** including pre-operative evaluation, intra-operative management as well as post-operative care, monitoring (invasive as well as non-invasive) as applied to various surgical specialities and age groups.

G. **Theory and practice of various techniques / aspects of Routine & Emergency cases** of **General Anaesthesia** (e.g., Intravenous / Inhalational, Endotracheal / Mask / LMA / COPA, Spontaneous/Controlled mode of ventilation, induced hypotension / hypothermia etc.), **Regional Blocks** (Spinal, Epidural & Peripheral Nerve block) and **Local Anaesthesia,** including **various postures** required for anaesthetic/surgical procedures, their effects **and Recent Advances** for most minor to supra major surgeries in the field of:

- **General surgery:** e.g. minor cases like haemorrhoidectomy to supra major cases like Liver transplant
- **Gynaecology and Obstetrics**
- **ENT and Head & Neck**
- **Orthopaedics**
- **Ophthalmology**
- **Pediatric & Neonate**: Differences between adult and pediatric Anatomy, Physiology, Pharmacology, Anaesthesia principles, pediatric/neonatal emergencies, postoperative care, fluid & ventilator management etc

- **Cardiac, Vascular & Thoracic:** Conduct of closed heart as well as open heart surgeries (Valvular, Ischemic, Congenital -Cyanotic & Acyanotic), CABG (including off pump), Pulmonary Cases (Insertion of Double Lumen Tube, one lung anaesthesia), Thymus and Vascular surgeries etc. Ability to go on Cardiopulmonary bypass and disconnect from bypass, Ability to take, manage and interpret Arterial, Central Venous and P.A. Lines, postoperative care, management of re-explorations etc.
- **Neurosurgery**: Ability to monitor ICP, Management of head injuries, bleeds, tumours, etc with raised ICT. Ability to safely manage cases in sitting, prone, lateral, jack-knife positions and Anaesthetic management for neuro-radiology procedures
- **Urology**: Management of endoscopic surgeries like TURP/TURBT etc, Problems related to TURP, extracorporeal shock wave lithotripsy, percutaneous placement of nephrostomy etc., anaesthetic management of patients with acute and chronic renal failure, anaesthetic management of renal transplant cases of donor as well as recipient.
- **Plastic**: Management of burns contractures, congenital faciomaxillary abnormalities like cleft lip and palate, faciomaxillary injuries like fracture mandible, maxilla, zygoma, panfacial fractures, difficult intubations, microvascular surgeries, reconstructive surgeries, aesthetic surgeries etc
- **Dental**: Monitored Anaesthesia Care, Anaesthetic management of pedodontia patients, maxillo-facial surgeries including TMJ Ankylosis, Awake, Retrograde & Fibreoptic intubations
- **Endoscopies / laparoscopies**: Anaesthetic management, specific requirement and complications of various endoscopies like cystoscopy, ureteroscopy, PCNL, hysteroscopy, thoracoscopy, mediastinoscopy etc. and Lap. assisted/laparoscopic surgery like hysterectomy, tube ligation, appendicectomy, cholecystectomy etc.
- Anaesthesia for various **diagnostic, therapeutic and Specialized** procedures
- Anaesthesia for **Geriatric patients**
- Anaesthesia for surgery using **LASER**
- **Anaesthesia / Sedation techniques out side operating room:** Electroconvulsive shock therapy (ECT), Electrophysiologic tests, Radiofrequency ablation, Cardioversion, Cardiac catheterization, Special anaesthetic considerations in radiology and interventional radiology related to Dye allergies, Embolization, Monitoring / Equipment options in the MRI suite

H. History of **Anaesthesia**

I. Airway Management: Assessment of difficult airway, Awake, Retrograde, Use of intubating LMA's, Intubating Stylets, Various laryngoscopes designated for difficult airway, Insertion of Combitube, Ability to perform Cricothyrotomy and use of Venturi, Minitrach & Fibreoptic intubations etc

J. Basic & Advanced Cardiopulmonary & Cerebral Resuscitation (**CPCR**) for all age group of patients under different situations e.g., neonates, pregnant females, poisoning cases, trauma victims etc.

K. Acid base & Fluid management including use of Crystalloids, Colloids, blood & blood products

L. Arterial, Central Venous and P.A. Lines: Establishment, management and interpretation

M. Anaesthetic drugs used in **perioperative care**

N. Equipments (Minor to advanced monitoring) – their use, maintenance, sterilisation and care

O. Medical gases: Knowledge of Manufacturing, Storage and Central pipeline Systems

P. Day Care / Outpatient Anaesthesia.

Q. Remote Location Anaesthesia: Anaesthetic practice during **disasters** and for large turnover surgeries in **camps / mass casualties**.

R. **Emergency** Anaesthesia
S. **Monitored Anaesthesia** Care
T. **Labour Analgesia**
U. **Pain relief –** Acute & Chronic
V. **Critical care practice** including oxygen therapy, respiratory therapy, ventilatory support, haemodynamic monitoring, prevention and management of multi organ failure, and care of patients with brain damage or brain dead patients For organ Transplant
W. **Advanced Trauma Life Support** (**ATLS**)
X. **Occupational Hazards**
Y. **Safety** in Anaesthesia
Z. **Complications of Anaesthetic procedures, its prevention, detection and management**
AA. **Record keeping** in Anaesthesia
BB. **Medical Audit**
CC. **Quality Assurance**
DD. **Anaesthesia standards:** e.g., Minimum monitoring standard
EE. **Medicolegal** aspects in Anaesthesia
FF. **Ethics** in Anaesthesia
GG. **Principles of Evidence Based Medicine**
HH. **Basic Research Methodology and Clinical Trials**
II. **Bio-statistics**
JJ. **Computers:** Utility, computer assisted learning and data storage, Computerised anaesthesia records
KK. **Skills:** for planning of operation theater, pain clinic, recovery room, intensive care etc. including selection and purchase of equipments

TRAINING PROGRAMME

A. ADMINISTRATION OF ANAESTHESIA & PERIOPERATIVE PATIENT CARE

I Year Residents:–

Assisting during minor & major anaesthesia procedures and managing patients in recovery or intensive care areas (all Under Supervision)

The first month of the first year will be spent in orientation in the operating rooms and attending lectures covering the basics of the discipline. After that the first year of training will be spent in learning the fundamentals of anesthesiology with emphasis on checking of anaesthesia equipment including anaesthesia machine, airway equipment and appropriate monitors, preparation of appropriate dosages of various drugs required at specific point of time, mastering clinical skills regarding selection and implementation of an appropriate anesthesia plan, placement of lines, induction of anaesthesia, intubation, maintenance of anaesthesia, and the successful reversal of anesthetic agents. Emphasis will also be placed on learning regional anaesthesia and Cardiopulmonary resuscitation. Also the candidates will be assigned guides for thesis so as to help them prepare protocols.

To start with the first year residents will observe and then slowly become independent in giving general anaesthesia and Regional anaesthesia to patients belonging to ASA grade I & II for minor and major surgery, under graded supervision. They will be posted in rotation to the following specialties during the first year**:** Preoperative assessment area, General Surgery, Gynecology, Obstetrics, Orthopedic, ENT, and Recovery Room. They will be assigned to cases in the Operating Room at the hospitals attached to medical teaching institutes affiliated to the University under which they have registered and will gain experience under the direction and supervision of respective academic faculty.

II Year Residents:–

Assisting during minor & major procedures under anaesthesia, managing patients in recovery or intensive care areas and Independently conducting minor procedures under anaesthesia (GA/RA) for ASA grade I or II patients (excluding expected difficult airway cases and cases with expected major body fluid shift)

The second year of training will be devoted to the subspecialties/superspecialities of anesthesia at the hospitals affiliated to medical teaching institute and the university under the supervision of a faculty member with an aim to concentrate on mastering the knowledge and technical skills associated with providing anesthesia to subspecialty/superspeciality patients. Residents will be rotated in Pediatric anesthesia, Neuroanesthesia, Cardiovascular and Thoracic anesthesia, Ambulatory anesthesia, Obstetrics, Dental Surgery, Ophthalmology, Pain Clinic / Pain Management, Peripheral Theatres, Anaesthesia Outside Operating Rooms, Trauma care, Transplant Surgeries etc. They will be taught to give general anaesthesia and regional anesthesia (Extradural Block - EDB, Spinal Block, and Peripheral Nerve Blocks) to ASA grade I, II, III & IV patients under supervision for superspeciality theaters. They should be able to give GA/RA to other ASA grade I & II patients independently. Rotations in critical care areas e.g., Trauma Ward, Post Anesthesia Care Unit / ICU / Emergency Medical Service will also be part of the second year training curriculum. They should learn pediatric and trauma life support and maintain skills for basic and advanced cardiac life support. The student should be able to analyze and present scientific data and write a thesis.

III Year Residents:–

Assisting during minor & major procedures under anaesthesia, managing patients in recovery or intensive care areas and Independently conducting both minor and major procedures under anaesthesia (GA/RA) for ASA grade I or II patients (excluding expected difficult airway cases and cases with expected major body fluid shift)

The third (final) year of training will be devoted to management of most complex cases available at the institute under the supervision of a faculty member. The residents will be trained to exercise independent judgment, to take responsibility while caring for such patients, and to take part in research projects under the supervision of a faculty member. The student should be able to plan and administer anaesthesia to all patients under graded supervision including patients for Cardiac, Neurosurgery, Pediatric surgery and for all major surgery of subspeciality branches. The aim at the end is to be competent and independent soon after the third year of residency in providing anaesthesia to elective and emergency cases belonging to all specialities. The resident should be able to manage critically ill patients and treat intractable pain. They should also know how to organize mass casualty.

B. THESIS -

- The aim of thesis should be to make the student able to demonstrate capability in research by planning and conducting systematic scientific inquiry & data analysis and deriving conclusion.
- Thesis protocol should be submitted at the end of six months after admission in the course to the Research Committee of the Institute. The protocol must be presented in the department of Anaesthesiology before being forwarded. The research committee appointed by the Dean/Principal to scrutinize in references to its feasibility, statistical validity, ethical aspects, etc would approve the Protocol.
- Protocol in essence should consist of:
  - **a)** Introduction and objectives of the research project.
  - **b)** Brief review of literature.
  - **c)** Suggested materials and methods, and (scheme of work)

d) Statistician should be consulted at the time of selection of groups, number of cases and method of study. He should also be consulted during the study.

e) Bibliography

- Chief guide for thesis will be from the department of Anaesthesiology and co-guide(s), if needed, will be from the department of Anaesthesiology or from other disciplines related to the thesis.
- The thesis shall relate to the candidate's own work on a specific research problem or a series of clinical case studies in accordance with the approved plan.
- The thesis shall be written in English, printed or typed on white A4 size bond paper bearing the matter on one side of paper only and bound with cloth/rexine, with the title, author's name and the name of the College printed on the front cover.
- The thesis shall contain: Introduction, review of literature, material and methods, observations, discussions, conclusion and summary and reference as per index medicus.
- Each candidate shall submit to the Dean four copies of thesis, through their respective Heads of the Departments, not later than six months prior to the date of commencement of theory examination in the subject

C. ACTIVITIES – Participation by way of attendance / presentation in Didactic lectures, Symposia, Seminars, Group discussions, Workshops, Morbidity & Mortality meet, Panel Discussion etc. **Each Student should have actively participated in at least 6 academic sessions per year** during the total training period of three years (total 18).

D. LOG BOOK MAINTENANCE of all the clinical and academic work done by the student in his/her tenure of three years.

Minimum Procedures/Cases required to be done and entered in the log book

Regional Block	
Spinal	= 30 to do
Epidural	= 30 to do
Combined Spinal Epidural	= 20 to do
Caudal	= 10 to do
Bier Block (IVRA)	= 5 to do
Sciatic/Femoral	= 5 + 5 (to observe or do)
Ankle Block	= 5 (to observe or do)
Stellate Ganglion Block	= 3 (to observe or do)
Brachial Plexus	= 5 to observe & 10 to do
Sympathetic Block	= 3 (to observe or do)
Trigger Point injection	= 3 (observe)
Other peripheral N. Block	= 3 to do
Ophthalmic Blocks	= 5 (to observe)
Field Block	= 3 (to observe or to do)
Anaesthesia for:	
General Surgery	= 50 (to do)
Gynecology	= 50 (to do)
Obstetrics	= 20 (to do)
ENT	= 20 (to do)
Orthopedics	= 20 (to do)
Ophthalmology	= 5 (to do)
Plastic Surgery	= 5 (to do)
Endoscopy / Laparoscopy	= 5 (to do)
Urology	= 5 (to do)

Open Heart	= 5 (to observe)
Closed Heart	= 5 (to observe)
Pediatric Surgery	= 5 (to observe)
Craniotomy	= 5 (to observe)
Spinal Surgery	= 5 (to observe)
Joint Replacement	= 5 (to observe)
Anesthesia for organ transplant	= 5 (to observe - desirable)
ECT	= 10 (to do)
Radiology / CT Scan	= 5 (to do) Anaesthesia/sedation
Procedures	
Internal Jugular Cannulation	= 5 + 5 (to observe or do)
External Jugular Cannulation	= 5 to do
Subclavian Vein Cannulation	= 5 + 5 (to observe or do)
Peripheral Central Line	= 15 to do
Arterial Line Cannulation	= 10 to do
Endotracheal Intubation	= 250 to do
LMA insertion	= 30 to do
Difficult Airway Management	= 5 to do
Conduct of Cases	
ASA I	= 300 to do
ASA II	= 200 to do
ASA III	= 50 (to observe)
ASA IV	= 30 (to observe)
Labour Analgesia	= 5 (to observe or do)

ASSESSMENT (*As per Direction No. 01/2008 dtd. 26/05/2008)*

Recommended Reading

I. Books

S.No	Name	Authors / Editors	Year of publication	Last Edition	Publication House
1	Lee's Synopsis of Anaesthesia	G.B.Cashman, N.J.H Davies	2006	13th	Butterworth-Heinemenn
2	Wylie & Churchill Davidson's – A practice of Anaesthesia	Thomas E. Healy Paul R. Knight	2003	7th	Arnold
3	Anaesthesia	Miller Ronald D.	2005	6th	Elsevier Churchill Livingstone
4	Yao and Artusio's Anesthesiology	Fun-Sun F.Yao	2003	5th	Lippincott Williams & Wilkins
5	Anesthesia and Co-existing Disease	R. K. Stoelting S.F. Dierdorf	2002	4th	Churchil Livingstone
6	Anesthesia and Uncommon Disease	Fleisher	2005	5th	Saunders Elsevier
7	Clinical Anaesthesiology	G.E.Morgan M.S.Mikhail	2005	4th	McGraw-Hill
8	Understanding Anaesthesia Equipment	Jerry A. Dorsch Susan E. Dorsch	1998	4th	Williams & Witkins

9	Wards Anaesthesia Equipments	Davey	2005	5th	Baillirro Tindall
10	Anatomy for Anaesthetists	Harold Ellis Stanley Fieldman	2005	8th	Blackwell Science
11	Pharmac. & Physiology in Anaesthetic Practice	R. K Stoelting S.C.Hillier	2006	4th	Lippincott-Raven
12	Shnider and Levinson's Anesthesia for Obstetrics	Hughes Levinsons Rosen	2002	4th	Lippincott Williams & Wilkins
13	Paediatric Anaesthesia	Gregory	2005	4th	Churchil Livingstone
14	Cardiac Anesthesia	Kaplan	2005	4th	W. B. Saunders & Co.
15	Thoracic Anesthesia	Kaplan	2003	3rd	Churchil Livingstone
16	Clinical Application of Mechanical Ventilation	David W. Chang	2001	2nd	Delmar-Thomas Learning

II. "Recent Advances in Anaesthesia and Analgesia" Last two Editions: Mosby Publications

III <u>Journals</u>

1. Indian Journal of Anaesthesia	5. Anaesthesia
2. Journal of Anaesthesiology and Clinical Pharmacology	6. British Journal of Anaesthesia
3. Indian Journal of Critical Care Medicine	7. Anesthesia & Analgesia
4. Anesthesiology Clinics of North America	8. Anesthesiology

Addition of Ultrasonography in curriculum of Anaesthesiology.

(12)

ULTRASONOGRAPHY SYLLABUS

[For MD/ DA Anaesthesiology Curriculum]

The following **'Ultrasonography Syllabus'** shall be included in the learning & training programme of MD & DA courses (Postgraduate degree & Postgraduate Diploma course) in Anaesthesiology.

'Ultrasonography syllabus' learning &practical training shall be completed by postgraduate students [during their three years course of MD in anaesthesiology] of MD anaesthesiology. The students shall be posted for ultrasonography training as follows:

a) 2nd term of first year = 10days posting
b) 2nd term of second year =10days posting
c) 1st term of third year =10days posting

'Ultrasonography syllabus' learning & practical training shall be completed by postgraduate students [during their two years course of DA in anaesthesiology] of DA anaesthesiology. The students shall be posted for ultrasonography training as follows:

a) 2nd term of first year = 15days posting
b) 1st term of second year =15days posting

The necessary skills of ultrasonography shall be acquired by the MD & DA students before appearing for final university theory & practical examinations of Maharashtra University of health sciences, Nashik.

The Head of the department shall prepare the time table/ posting of MD & DA postgraduate students by rotation in the Radio-diagnosis department of their respective Medical Colleges.

As per the syllabus & in relation to anaesthesiology practical skills, the basic applied & practical trainingof Ultrasonography &Doppler shall be conducted by the faculty of Radio-diagnosis department of the respective Medical Colleges.

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KNOWLEDGE TO BE ACQUIRED BY MD & DA P.G. STUDENTS

1. **Ultrasound Physics- Image generation** = [2Theory Lecture]
   a) Ultrasound waves
   b) Piezoelectric effect
   c) A B M modes
   d) Principle of Doppler
2. **Equipment** = [1 Theory Lecture]

a) Probe selection; b) Knobology; c) Depth , Gain, MB, Needle guide etc d) Image storing & archiving

3. **Sono-anatomy of common arteries, veins and nerves** = [2 Theory Lecture]
   a) Applied sono-anatomy of Brachial Plexus, Lumbarplexus& Sacral plexus
   b) Applied sono-anatomy of thoracic, lumbar, PV areas.
   c) Ability to interpret 3D anatomy from 2D cross sectional image.
   d) Applied sono-anatomy Neck for central venous canulation of IJV, subclavian vein
   e) Applied sono-anatomy of abdomen- spleen, liver & kidney, IVC, Aorta & Portal vein. [For assessment of soft organ injury in trauma cases]
4. **Skills to be attained**

i) Image acquisition
ii) Ability to effectively apply "PART" maneuver- pressure, alignment, rotation & tilting
iii) Performance, patient, monitor- ergonomics.

2. Needling (Get the needle on the target)

i) In plane & out of plane concepts.
ii) Ability to use needle visualization preset.
iv) Ability to get the target, needle tip visualization.

5. **Teaching & Learning Methods**

- Lectures to cover up the basic principles & sono-anatomy
- Practical demonstration in the operating room
- Phantom training for needling.

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6. **Attitude and Behavior**

- Provides explanations of regional anaesthesia techniques in a way that patients can understand.
- Understand the patient anxieties about regional techniques, especially the stress of undergoing surgery while conscious.
- Recognizes the need for communication with staff about use of regional block
- Handles patient gently during performance of regional block.
- Meticulous attention to safety and sterility during performance of regional blocks.
- Enlist help/ advice from other professionals when appropriate.

7. **Workplace & training objectives**

- Trainees should take appropriate opportunities to use regional anaesthesia in patients undergoing a range of operations in specialties' such as orthopedics, gynecology, urology and plastic surgery I order to demonstrate their attainment of the listed requirements
- Lectures to cover up the basic principles and sono-anatomy.
- Practical demonstration the operation room
- Phantom training for needling

8. **USG guided central venous cannulations**

- Internal Jugular Vein; Subclavian Vein; Femoral vein

9. **Cleaning & Disinfection**

a) Knowledge about the cleaning solutions & its implication

10. PCPNDT act Rules & regulation & guidelines

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Passed by Academic Council (Resolution No. 355/2006) dtd. 30/05/2006, subject to Uniformity in the Examination pattern.

P.G. CURRICULUM IN THE SUBJECT OF ANATOMY

A. Goal: To prepare the postgraduate student to become an exemplary teacher and a research scientist par excellence. To achieve this goal, the postgraduate student in Anatomy should be given an overall exposure to the subject, teaching methodologies and a sound grounding in research technologies.

B. Learning objectives: To achieve this goal, the following objectives must be fulfilled.

I. Cognitive domain: At the end of three years of postgraduate training the student should be able to

1. Describe the gross anatomy of the human body and correlate the knowledge of structure and function.
2. Describe the microanatomy including cytology of various structures of the human body and compare the knowledge of microstructure with function and interpret it accordingly.
3. Interpret the anatomical basis of symptoms and signs of clinical conditions, diagnostic procedures and treatment modalities.
4. Describe the developmental aspects of human body and interpret the developmental basis of various congenital anomalies.
5. Describe the neuroanatomy in its entirety and interpret the neuroanatomical basis of various clinical conditions.
6. Explain various aspects of genetics and describe genetic basis of disorders and principles of genetics counseling.
7. Explain and interpret radiological anatomy and sectional anatomy of the human body as studied by various imaging techniques.
8. Comprehend surface and living anatomy of the human body.
9. Relate forensic anatomy to the study with medicolegal aspects of bone in particular.
10. Explain the general principles of Anatomy Act and Transplant of Human Organ Act.
11. Explain the process of embalming.
12. Comprehend ethical aspects of biomedical research.
13. Comprehend the basis of disposal of biomedical waste.
14. Comprehend horizontal integration of various subdivisions of anatomy with relevant physiology and biochemistry.

II. Psychomotor domain: At the end of the training, the student should be able to

1 Dissect and demonstrate various parts of adult human body

2. Demonstrate surface landmarks and living anatomy pertaining to mucle power, testing of nerves and palpating vessels.

3. Dissect and demonstrate various parts of a fetus .

4. Prepare tissue blocks ,perform H&E staining and is able to explain the principles of the following special stains -silver nitrate, periodic acid Schiff, osmic acid, Masson trichome, Verhoeff and Orcein stains .

5. Prepare and deliver lectures on various topics of human anatomy using audio-visual aids.

6. Operate computers so as to prepare documents, tables, charts and projection slides.

7. Identify research topics; carry out research and prepare a dissertation on a topic.
8. Present paper / poster in conferences.
9. Set undergraduate theory question paper, evaluate students and able to compute results including internal assessment marks.

III. Affective domain: At the end training the students should be able to

1. Co-operate with and react and respond in a cordial manner in his /her interaction with peers, superiors and subordinates.
2. Project a cheerful persona to the students.
3. Inspire the students to reach greater heights.
4. Arouse an element of curiosity and wonder in the minds of students.
5. Maintain a log book (Appendix - I).
6. Develop a healthy personality and a liking and respect for the subject.

C. COURSE DESCRIPTION

I. Eligibility: As per the guidelines of Medical Council of India and affiliated university.

II. Duration: 3 years

III. Desirable qualities: The student should have an aptitude for teaching and reasonable command over spoken and written English language

IV. Details of Training: **T**he P.G. student would be a resident in the department for 3 years. The time-plan and the proposed division of curriculum will be on the following lines.

1. FIRST YEAR OF RESIDENCY

a. ***Orientation programme***- Institutional and departmental orientation including duties and responsibilities of a postgraduate student.

b. ***Time Management*** - should be conducted within 3-6 month.

c. ***Stress Management***- should be conducted within 3-6 months.

d. **Gross anatomy**: Dissection of one whole human body and study of gross anatomy and acquisition of embalming skills.

e. **Microanatomy**: Basic techniques in tissue processing, preparation of blocks, microtome sections and H & E and principles of the following special stains -silver nitrate, periodic acid Schiff, osmic acid, Masson's trichome, Verhoeff and Orcein stains.

f. To attend all undergraduate lectures held in the department of Anatomy and all the lectures organized by the university by various PG teachers at different colleges.

g. To present the topic for dissertation and the research design in front of a dissertation committee comprising of all senior and PG teachers in the department within first six months of registration. Thereafter periodic assessment of the progress of the dissertation (every 6 monthly) will be done by the concerned PG teacher and if required, by the dissertation committee.

h. Get trained to use computer for teaching and use the internet

i. Scan Anatomy journals and periodicals.

j. **OPTIONAL yet DESIRABLE**: To attend all the orations/ seminars/ workshops held for the subject in the city colleges, attend general orations held in the institution and attend regional /national conferences.

k. **TEACHING**

i. 70 hours of small group teaching with at least l/3 of these under supervision by a senior teacher.
ii. **Microteaching sessions** are mandatory before small group teaching for each and every session.
iii. Should be exposed to evaluation techniques
iv. Exposure to Medical Education Technology Workshops
v. Presentation in Journal club.
vi. Presentation in Seminars and symposia.
vii. Should complete gross and microanatomy journals.

l. **RESEARCH**

i. Basic techniques like review of literature for a given topic and collection of data.
ii. Exposure to computer for various applications.

2. II YEAR OF RESIDENCY

a. SPECIAL POSTING

Interaction with other pre, para and clinical specialties so as to prime the mind of the P.G. students in Anatomy to the growing needs of application of anatomical knowledge to other branches of medicine .This will be achieved through **horizontal and vertical integration**.

Posting

i. Horizontal Integration

(Selected topics should be taken as PG lectures by the concerned departments.)

Physiology and Biochemistry

ii. Vertical integration (Lectures to be arranged by the various departments for PG students)

Radiology, Surgery, Orthopaedics, Medicine, Obs &Gynac, Genetic Laboratory Pathology, Microbiology& Forensic.

(Posting in pathology - to gain knowledge about Frozen-sections, use of cryostat. special immunohistochemical techniques and immunological techniques and morbid and medicolegal anatomy from postmortem.)

During vacation.

b. RESEARCH

Starting the work on thesis by the beginning of second year of residency with the aim to complete the data collection & analysis by the end of second year.

c. TEACHING

i. From middle of IInd year, the P.G. students in Anatomy should be capable of giving lectures for the entire batch of students.
ii. Start teaching Embryology and Genetics in small groups after microteaching Sessions.
iii. Should be conversant with the use of various audiovisual aids

d. Presentation in Journal Club

e. Presentation in Seminars / Symposia at the departmental and institutional level

f. FETAL DISSECTION: Should have dissected at least one fetus

3. III YEAR OF RESIDENCY

a. RESEARCH

i. Completion of Dissertation
ii. Presentation of paper in conference (optional but desirable)
iii. Writing articles for publication

b. TEACHING

i. Full fledged lectures, lecture-demonstration, small group teaching
ii. Seminars / Symposia
iii. Journal Club

c. DISSECTION - Exercise in window-dissection of various regions.

V. SYLLABUS

1. Postgraduate curriculum shall include the entire undergraduate curriculum as spelt out below (Appendix III) with modifications as under:
Levels 1 & 2 of U.G. curriculum will become Level 1 of P.G curriculum.
Levels 3 of U.G curriculum will become Level 2 of P.G. Curriculum
Levels.3 of P.G. Curriculum will include current trend and recent advances in the Concerned topic and historical aspects.

2. Additional topics to be covered

a. History of anatomy
b. Embalming techniques
c. Microanatomy
   i. Principles and types of Electron microscopy: TEM, SEM
   ii. Identification of various cell organelles and their EM appearance

a. Embryology: Stem Cell.
b. Genetics : a)Exposure to various DNA technologies, including cell culture, Karyotyping, Polymerase Chain Reaction (PCR) and Fluorescent-in-Situ-Hybridization (FISH)
c. Neuroanatomy: Limbic system and Reticular Systems - Details
d. Clinical Anatomy: Application of anatomical knowledge to explain the anatomical basis of various clinical symptoms and signs, diagnostic procedures and treatment modalities
e. imaging Modalities
   i. Radiology
   ii. Ultrasonography (USG): - Principles of USG, Orientation of anatomical organs, in various USG plates. Structures as seen in 2-D echocardiography axes used and orientation of heart in various axes in 2-D echocardiography.
   iii. PET scan: Principles.

f. Forensic Anatomy: Estimation of age and sex
   i. With reference to bones including ossification
   ii. With reference to radiology pictures
g. Cross-sectional Anatomy and its correlation to C.T. scan images and MRI images
h. Comparative Vertebrate Anatomy: Basic outline
l. Anthropology: Basic principles and anthropometry

D. EVALUATION

I. FORMATIVE: Internal assessment based on

1. Teaching: to be evaluated based on a given proforma (Appendix II)
2. Dissection
3. Log Book
4. Journals-Microanatomy and Gross anatomy
5. Examinations

a. Theory:

i. At the end of first year, two papers on general anatomy, gross anatomy, and microanatomy of the

* Upper half of the body: Head (without neuroanatomy), neck, upper limb, thorax and general anatomy.

** Lower half of the body: Diaphragm (Thoracoabdominal), abodomen, lower limb and general microantomy.

ii. At the end of second year, two papers on

* Embryology and Genetics (Including a. i. **).

** Neuroanatomy and applied anatomy (Including a. i. *)

30% of the paper will be constituted by multiple choice questions of the following types: Single best response, multiple true false, multiple completion and assertion reason.

iii. At the end of third year, preliminary examination as per the university examination

b. Practicals and viva

i. At the end of first year,

* Prepare a tissue block, stain and discuss. 10 microanatomy spots.

** Window dissection and viva on Osteology and soft parts.

ii. At the end of second year

* Viva on embryology models (Including b. i. *)

** Viva on brain (Including a. i. **)

iii. At the end of third year, preliminary examination as per the university examination.

II. SUMMATIVE

1. By points system – The following point scale should be strictly adhered to Points in fractions should not be assigned.

Point System	Remarks
0(Zero)	Very poor
1(one)	Poor
2(Two)	Below Average
3(Three)	Average
4(Four)	Good
5(Five)	Very Good
6(Six)	Outstanding

a. Theory: 4 papers (***As per Direction No. 01/2008 dtd. 26/05/2008 & practical scheme is as per revised practical marksheet.)***

E. LIST OF RECOMMENDED BOOKS

I. Textbooks:

1. Cunningham's Manual of Practical Anatomy - Latest editions of volumes I, II, III
2. Regional & Applied Anatomy - R. J. Last
3. Clinical Anatomy for Medical Students - Richard Snell
4. Synopsis of Surgical Anatomy - McGregor
5. Functional Histology - Wheater, Burkit,
6. Langman's Medical Embryology
7. Embryology by Keith Moore
8. Clinical Neuroanatomy – Snell
9. The Human Nervous System - Murray Barr, John Kieman
10. Genetics by Emery
11. Human Genetics - S.D. Gangane
12. Essential of Human Genetics by Bhatnagar, Kothari and Mehta
13. Cross-sectional anatomy by Bo, Meehan and Kruger
14. Principles of General anatomy by A. K. Dutta
15. Comparative anatomy A.S. Romer.

II. Reference Books:

1. Gray's Anatomy
2. Clinical Anatomy _ NMS Series
3. Anatomy for Surgeons - Henry Hollinshead
4. Surgical Anatomy - Harold Ellis
5. Bailey's Textbook of Microscopic Anatomy
6. Embryology - Boyd & Mossman
7. Clinically oriented anatomy _ Keith Moore
8. Atlas of Human Histology – Di fiore
9. Tissues of the Human Body by Le Gros Clerk
10. Genetics by Thompson and Thompson
11. History of Anatomy - Charles Singer
12. History of Anatomy Indian Medicine - Kutumbiah
13. Dorlands Medical Dictionary

III. Journals:

1. Journal of Clinical Anatomy
2. Surgical & Radiological Anatomy
3. Journal of Anatomy
4. Development Dynamics
5. Anatomical Record
6. Journal of Anatomical Society of India

Appendix I (LOG BOOK)- Not yet FINALIZED

Log book details

Sr.No.	Date	Time	Topic /Activity	Teacher	Remarks and sign of PG teacher

*Topic – Topic of lecture/Demonstration attended
Topic of Lecture/Demonstration taught

*Activity- Dissection – Part

- Microanatomy- Practical
- Special posting- Department

** Fortnightly submission of the logbook to the concerned PG teacher and signature obtained

Appendix II

Direction- Please tick the statement, which most closely corresponds to your observation.

Name of the teacher : _____

Topic : _____

Date : _____

SrNo	Skill		Teacher Action	Yes	To some extent	No
1	Set Induction	a)	Aroused interest at the beginning			
		b)	Specified objectives of presentation			
2	Planning	a)	Organised material in a logical sequence			
		b)	Used relevant content matter			
3	Presentation	a)	Fluency in language			
		b)	Used non verbal cues, eye contact etc			
4	Interaction	a)	Allowed questions from students			
		b)	Asked Questions			
		c)	Rewarded pupil effort			
		d)	Clarified doubts			
5	Use of A V aids	a)	Used proper A V aids			
		b)	Used the aid effectively			
6	Summarization	a)	Summarized the important points at the end			
		b)	Checked that all the students understood the Points			
		c)	Lesson on the whole was effective			
7	Any suggestions for the speaker to improve the Teaching/earning exercise					

Draft Syllabus Prepared by Sub Committee on 06/01/2014 as per meeting of BOS on 07/10/2013 & Faculty of Medicine 08/10/2013. To be Submitted to BOS on 20/03/2014 & Faculty on 21/03/2014

Final Syllabus passed by Academic Council on 21/05/2014 Item No. 28 /2014. Subject to Uniformity in the University Examination System.

FACULTY OF MEDICINE

SYLLABUS

FOR

M.D. & DDVL IN DERMATOLOGY, VENEREOLOGY AND LEPROSY

MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES

NASHIK

DERMATOLOGY , VENEREOLOGY AND LEPROSY — M D & DDVL

Dermatology including Venereology (STD) and Leprology is one of the important basic clinical speciality. Considerable advances have taken place in the understanding of dermatological disorders and their treatment. Leprosy is still a public health problem of considerable magnitude in the country. The STDs are showing worldwide increase in incidence with new dimensions added to it.
There is a dearth of trained personnel in the speciality. Very few medical college in the country impart sufficient knowledge about these diseases at Undergraduate level and Postgraduate courses are not available in all medical colleges.
The curriculum of MD Dermatology has been made designed matching the other clinical specialities at the Institute. An attempt has been made to give a comprehensive training to the postgraduates including basic subjects and recent advances.

OBJECTIVES

At the end of this training a candidate should be able to
1. Diagnose and manage independently common skin diseases, sexually transmitted diseases and leprosy.
2. Manage independently and efficiently all medical emergencies related with skin, leprosy and venereal disease.
3. Adopt preventive measures at individual and community levels against communicable skin, venereal diseases and leprosy.
4. Teach requisite knowledge and laboratory skills to other medical/paramedical team members.
5. Adopt a compassionate attitude toward towards the patients (and their families) under his/ her charge.
6. Critically evaluate and initiate investigation for solving problems relating to skin, venereal diseases and leprosy.

SKILLS TO BE LEARNT

1. History taking for dermatology, venereology and leprosy
2. Describe cutaneous findings in dermatological terms in a systematic way.
3. Evaluate and manage the common diseases in dermatology and have a broad idea how to approach an uncommon diseases.
4. Evaluate and manage STD cases
5. Evaluate and manage HIV positive cases
6. Systemic examination relevant for dermatologic condition
7. Maintain basic skills like pulse, blood pressure chest and cardiac auscultation learnt in MBBS
8. Care of dermatologic emergencies like TEN, Pemphigus, necrotic ENL, angioedema, drug reactions etc.
9. Management of pediatric cases with skin diseases
10. To achieve adequate skills for tests done in side laboratory in day-to-day practice and be familiar with other sophisticated investigations.

Fundamentals of Cutaneous Diagnosis-

Basic skin lesions, history taking, examination of the patient including relevant diagnostic, clinical tests and aids.

Duration of Course –

Full Time: 3 Academic Years for PG Degree Course and Full Time 02 Academic Years for Diploma course.

SYLLABUS

Topics Related to Allied Basic Sciences

The structure, function and development of human skin. Skin as a barrier
Ultra structural aspects of epidermis, epidermal appendages, dermoepidermal junction, dermis, and sub-cutis
Immunology, Molecular biology and genetics in relation to the skin.
Epidermal cell kinetics and Keratinization
Lipids of epidermis and sebaceous glands
Percutaneous absorption
Biology of eccrine and apocrine sweat glands
Biology of hair follicles, sebaceous glands and nails
Biology of melanocytes and melanin formation
Disorders of keratinisation
Epidermal proteins
Dermal connective tissue : collagen, elastin, reticulin, basement membrane and ground substance
Metabolism of carbohydrates, proteins, fats and steroids by the skin
Cutaneous vasculature and vascular responses
Mechanism of cutaneous wound healing
Cellular and molecular biology of cutaneous inflammation
Immunoligic aspects of skin
HLA system, Immunoglobulins, cyto kines
Complement system
Hyper-sensitivity and allergy
Cutaneous carcinogenesis
Basic of cutaneous bacteriology, mycology, virology, parasitology and defence mechanism.
Common laboratory procedures, stains culture media and related serological tests
Basic pathologic reaction pattern in skin
Common and special histopathological stains and procedures used in the diagnosis of skin diseases and Special techniques such as immunofluorescence, immunoperoxidase and other related techniques.

Clinical Dermatology

Epidemiology of cutaneous diseases
Pyschologic aspects of skin disease and psycho-cutaneous disorders
Pathophysiology and clinical aspects of pruritus.

Papulo-squamous Diseases

Psoriasis, Pityriasis rubra pilaris, pityriasis rosea Licen Planus, lichenoid eruptions
Parapsoriasis, Palmoplantar Keratodermas.
Darier.s disease. Prorokeratosis
Ichthyoses and ichthyosiform dermatoses, Keratodermas

Vesiculo-bullous Disorders

Pemphigus group of disorders
Bullous pemphigiod

Chronic bullous disease of childhood
Familial benign pemphigus
Herpes gestationis
Mechanobullous (hereditary and acquired)
Epidermolysis bullosa acquisita
Dermatitis herpetiformis
Erythema Multiforme
Subcorneal pustular dermatoses

Disorders of Epidermal Appendages

Disorders of hair and nails
Disorders of sebaceous glands : Acne
Rosacea, Perioral dermatitis,
Disorders of eccrine and apocrine sweat glands

Tumours

Naevi and hamartomas
Precancerous Skin lesions, Squamous cell carcinoma and Basal cell carcinoma, malignant melanoma.
Pagets disease, Keratoacanthoma.
Benign epithelial tumours, appendageal tumours

Disorders of pigmentation

Vitiligo Albinism, Benign neoplasia and hyperplasias of melanocytes, Dyplastic melanocytic nevi, hyperpigmentation

Inflammatory Disorders of the Dermis

Acute Febrile Neutrophilic dermatosis
Erythema elevatum diutinum
Cutaneous eosinophilic diseases
Granuloma faciale
Pyoderma grangrenosum
Erythema annulare centrifugum and other Figurate Erythemas
Granuloma annulare
Malignant atrophic papulosis
Neoplasms, Pseudo neoplasms and Hyperplasias of the Dermis
Vascular Anomalies, Kaposi.s Sarcoma
Anetoderma and other Atrophic Disorders of the skin
Neoplasias and hyperplasias of Neural and Muscular origin
Elastosis Perforans Serpiginosa, Reactive Perforating Collagenosis, Kyrle.s disease

Lymphomas, Pseudolymphomas and Related Conditions

Disorders of Subcutaneous Tissue

Panniculitis
Lipodystrophy
Neoplasms of the subcutaneous Fat

Disorders of the Mucocutaneous Integument.
Biology and disorders of oral mucosa
Disorders of anogenitalia of males and females

Cutaneous changes in disorders of altered reactivity

Genetic Immunodeficiency Disease
Urticaria and Angioedema
Disorders associated with complement abnormalities
Graft-versus-Host Disease
Muco-cutaneous manifestations in immunosuppressed host other that HIV-infection
Contact Dermatitis
Auto sensitization dermatitis
Atopic dermatitis (Atopic Eczema)
Nummular eczematous dermatitis
Seborrhoeic dermatitis
Vesicular plamoplantar eczema
Erythrodermas

Skin Changes Due to Mechanical and Physical Factors

Occupational skin disease
Radiobiology of the skin.
Skin problems in amputee.
Sports Dermatology.
Skin problems in war field.
Decubituls ulcers.
Radiation to the skin
Skin diseases due to cold, heat

Photobiology of skin

Normal reaction to ultra violet rays and sun exposure

Disorders Due to Drugs and Chemical Agents

Erythema multiformae, Stevens-Jhonson syndrome, toxic epidermal necrolysis and
Cutaneous reactions and mucocutaneous reactions to chemicals and drugs
Pathological response to UVR and sun exposure
Cutaneous manifestations of drug Abuse

Abnormal vascular response

Erythemas including annular erythemas
Urticaria
Vasculitis

Dermatology and age of man

Ageing of skin
Neonatal dermatological problems
Pediatric and adolescent problems
Geriatric dermatological problems

Skin Lesions in nutritional, heritable and metabolic disorders

Cutaneous Changes in nutritional disorders.
Acrodermatitis enteropathica and zinc deficiency disorders.
Cutaneous Changes in errors of amino acid metabolism

Porphyrias
Xanthomas
Disorders of lipid metabolism and storage
Mucinosis
Amyloidosis
Angiokeratoma corpris diffusum
Lipid proteinosis
Malabsorbtion
Vitamin and mineral deficiency and excess

Skin Manifestations of systemic disorders

Skin and disorders of the alimentary tract
Hepatobiliary system and the skin
Cutaneous changes in renal disorders, cardiovascular, pulmonary
disorders and endocrinal disorders
Skin changes in pregnancy
Cutaneous changes in haematological disease (Langerhans Cells and other cutaneous histiocytosis, Mastocytoses Syndrome)
Cutaneous changes in endocrine disorder
Flushing and carcinoid syndrome.

Genodermatosis

Phacomatosis
Tubero sclerosis
Incontinentia pigmentation
Ectodermal dysplasia
Xeroderma pigmentosis

Connective tissue disorder and Skin manifestations of rheumatological diseases

- Reiter's syndrome.
- Arteritis and venulitis.
- Lupus erythematosus
- Dermatomyositis
- Scleroderma
- MCTD (Mixed connective Tissue Disorders)
- Relapsing polychondritis
- Rheumatoid arthritis, rheumatic fever and gout
- Sjogren.s syndrome
- Raynaud.s phenomenon
- Multicentric reticulohistiocytosis

Cutaneous Manifestations of Disease in Other Organ Systems

Sarcoidosis of the skin
Cutaneous Manifestations of Internal Malignancy
Acanthosis Nigricans
Papular Mucinosis
Neurocutaneous Disease
Tuberous Sclerosis Complex
Neurofibromatosis
Ataxia Telangiectasia
Behect.s Disease

Bacterial infections

Pyodermas : Staphylococcus aureus, Streptococcus, and others
Staphylococcal scalded-skin syndrome
Soft tissue infections : Erysipelas, Cellulitis
Systemic bacterial infections with cutaneous manifestations
Cutaneous tuberculosis and atypical mycobacterial infections
Actinomycetoma

Fungal infections

Superficial fungal infection : (dermatophytosis, yeast, others)
Deep fungal infections

Viral and rickettsial infections

Herpes simplex virus infections
Varicella . zoster infection
Human papilloma virus
Molluscum contagiosum
Hepatitis B, C
Rubella
Measles

Parasitic and protozoal infestations

Scalries
Pediculosis.
Arthropods and skin.

THERAPEUTICS

Topical Therapy

Pharmacokinetics and topical applications of drugs
Principles of topical therapy, topical formulations

Topical Agents
Glucocorticoids, analgesics, anesthetics, antinflammatory, anti microbial, anti parasitic, antiperspirants, antipruritic, antiviral, astringents, bleaching agents, keratolytics and keratoplastic agents.
Therapies, antiviral, topical antibiotics, topical antifungal agents, sunscreens, cytotoxic agents, retinoids, Vit D3 analogues, cosmetics and skin care in practice, emollients and moisturizer.

Systemic Therapy
Systemic glucocorticoids, antibiotics, antileprosy and antituberculous agenst, sulfones, aminoquinolines, cytotoxic and antimetabolic agents, oral retinoids, antihistamines, antiviral drugs, oral antifungal agents, immunosuppressive and immunomodulatory drugs, thalidomide. Antiparasitic drugs, antiandrogens, interferons, biologics, intravenous immunoglobulins, antiplatelet agents, psychotropic agents. other misc. systemic drugs

Dermatosurgery including Cosmetic dermatology
Local aneasthesia and nerve blocks, electrosurgery/ cautery, vitiligo surgeries, cryotherapy, electrolysis, tattooing, intra-lesional injections, iontophoresis, dermabrasion, biopsy techniques, hair and nail minor surgeries, excision surgeries.
Lasers in dermatology - for vascular, hair and pigmented disorders.

Skin resurfacing : chemical peels
Skin resurfacing : dermabrasion
Skin resurfacing : Laser
Skin punch grafting
Wound dressings
Sclerotherapy for varicose and telangiectatic veins
Botulinum injections.
Tumescent liposuction
Substances for soft tissue augmentation
Hair transplantation and alopecia reduction
Cryosurgery
Mohs micrographic surgery
Nail surgery

Photochemotherapy and Photo therapy including principles and use of Narrow band UVB, PUVA, UVB in Skin diseases.

STD
Clinical approach to the patient with STD
Anatomy of male and female genitalia
Epidemiology of STD's
Human Sexuality.
Viral STD.s including HIV, HSV, HPV, Molluscum contagiosum, EBV etc.
Bacterial STD.s : Syphilis, gonorrhoea, chancroid, donovanosis, bacterial vaginosis
Chlamydial and mycoplsma infections : Lymphogranuloma venereum, urethritis, cervicits, NGU
Fungal : Candidiasis
Protozoal : Trichomoniasis
Ectoparasitic : scabies, pediculosis infestations.
Syndromic management of STD.s
STD.s in reproduction health and paediatrics
STD.s and HIV
Post exposure prophylaxis
Prevention, counseling and education of different STD.s including HIV
National control programmes of STDs and HIV infection
Medicolegal, social aspects of STD.s including psychological and behavioural abnormalities in STD patients.

Management of Antiretroviral Therapy of Adults and Adolescents.
- Diagnosis of HIV Infection in Adults and Adolescents.
- Assessment of Adults and Adolescents with HIV Infection and pre- ART Care and Follow-up.
- Prophylaxis of Opportunistic Infections.
- ART in Adults and Adolescents.
- Routine Monitoring of Patients on ART.
- ART in pregnant Women, PPTCT and Previous Exposure to NVP.
- Considerations for Co-infection with HIV.
- Antiretroviral Drug Toxicity.
- ART Treatment Failure and When to Switch.
- Choice of ARV Regimens in the Event of Failure of First-line Regimens.
- Nutritional Aspects of HIV.
- Palliative Care in HIV.
- NACO Standardized Reporting and Recording System.

Management of Occupational Exposure including Post-exposure Prophylaxis.
Cutaneous Manifestation and Lab-diagonasis of HIV.
Prevention aspect of STD's (Condoms, Vaccines etc).
Prevention, counseling and education of different STD.s including HIV
National control programmes of STDs and HIV infection

Medicolegal, social aspects of STD.s including psychological and behavioural abnormalities in STD patients

LEPROSY

Approach to the patient with leprosy
Epidemiological aspects
Structure, biochemistry, microbiology of Mycobacterium leprae
Animal models
Pathogenesis
Classification
Immunology and molecular biological aspects
Histopathology and diagnosis including laboratory aids
Clinical features
Reactions
Systemic involvement (ocular, bone, mucosa, testes and endocrine etc.)
Pregnancy and leprosy
HIV infection and leprosy
Therapeutic aspects including newer drugs
Immunotherapy,
Disabilities, deformities and rehabilitation
Prevention, education and counseling
National leprosy control and elimination programme

DIPLOMA IN VENEREOLOGY AND DERMATOLOGY PRACTICAL/ CLINICAL EXAMINATION :-

Sr. No.	Heads	Marks
1	One Long Case	80
2	Two Short Cases	30×2=60
3	Viva	80
4	Spotters Ten	5×10=50
5	Histopath Slides	3×10=30
Total Marks	**300 Marks**	

Subheads to be added to Draft Syllabus for MD and DDVL

Basics of Dermoscopy and Trichoscopy

Cosmetic Dermatology
Chemical Peels,
Lasers,
Botox and fillers,
Facial rejuvenation

Continuing Medical Education:

1) University should sponsor CMEs to be held by rotation in each of the medical colleges affiliated to the university on the subjects of (or related subjects)
    a. Dermatopathology
    b. Dermoscopy
    c. Skin in internal medicine
    d. Genodermatoses
    e. Autoimmune diseases
    f. Contact Dermatitis
    g. Ultraviolet therapy
    h. Vitiligo
    i. Pigmentary diseases
    j. Leprosy

2) Faculty development:

    a. Faculty training: Each of the medical college departments may be identified as a training centre for one or two subspecialties mentioned above. Faculty from other medical colleges interested in getting trained in that department for that subject should be given the opportunity to attend the training for one to two weeks on deputation from their department under a university program. Faculty may also be encouraged to acquire experience in related fields by attending part time at an allied department in the same hospital.

    b. Foreign Conferences - leave and support: Each senior faculty (Professor and Associate Professor), should be given 5 days leave once a year to attend a conference or training abroad. Financial assistance for such travel may be given if the faculty is invited to present a paper at the conference.

3) Books and journals: Currently students and teachers are unaware of the availability of digital resources provided by MUHS. Awareness drive should be held to improve visibility of this vital resource. Students should be given a handout of the facilities at the time of registration.

    a. The number of books and journals provided in the MUHS digital library should be increased. I recommend the following additional journals:
        Indian Journal of Dermatology
        International Journal of Dermatology
        Indian Journal of Sexually Transmitted Infections and AIDS
        Journal of American Academy of Dermatology
        Journal of European Academy of Dermatology and Venereology

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MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES

Syllabus / Curriculum for

MD (General Medicine)

GOAL

A postgraduate in a general medicine is expected to diagnose and treat common medical illnesses and have a sufficient knowledge of rare diseases, advances and technologies in medicine. He should be able to manage medical emergencies and carry out research and undergraduate medical teaching.

OBJECTIVES: To achieve the goal following objectives must be fulfilled:

A) COGNITIVE DOMAIN:

1. Proper history, examination and diagnosis.
2. Relevant investigations, their interpretation with reasonable accuracy.
3. Appropriate treatment and early disposal.
4. Prompt diagnosis and management of emergencies.
5. Update knowledge
6. Teach and guide undergraduate (MBBS) students.
7. Carry out research and publication.

B) PSYCHOMOTOR DOMAIN:

1. To perform diagnostic/ therapeutic procedures like central venous line insertion, lumbar puncture, pleural/ pericardial/ ascites tapping, bone marrow aspiration, liver/ kidney/ pleural biopsy, and interventions such as mechanical ventilation, tube thoracostomy, cardiopulmonary resuscitation, temporary pacing etc.
2. To be familiar with complication of procedures and be equipped in their management.

C) AFFECTIVE DOMAIN:

1. Ethical principles during work
2. Seek and give consultation when required.
3. Sympathetic behavior with patients and their relatives.
4. Respects patients' rights and privileges.
5. Supplement information about their illness.
6. Consider seeking second opinion when requested by patients.
7. Develop communication skills to interact with colleagues, senior and paramedical staff.
8. To realize that patient management is a team work.

COURSE DESCRIPTION

Duration: 3 years Residency program

SCOPE OF TRAINING

Diseases related to general medicine, relevant radiology techniques, emergency and intensive care management, maintaining records, use of computers and basic research. Patient care in the settings of outdoor, day care, indoor, emergency and intensive/ critical care.

COURSE CONTENTS

I) Knowledge a) Applied basic science knowledge
b) Diseases with reference to General Medicine **(appendix -1)**
c) Recent advances
d) Biostatistics and clinical epidemiology

2) Skills:- a) Decision making
b) Diagnostic investigation and procedures
c) Monitoring seriously ill patients
d) Counseling patients and relatives
e) Ability to teach undergraduate students
f) Ability to carry out research

TEACHING & LEARNING ACTIVITIES

a) Ward/OPD patient management
b) Long and short topic presentations
c) Ward rounds, case presentations and discussions
d) Clinico-radiological and clinico-pathological conferences
e) Journal conferences
f) PG Case presentation clinics
f) Research review
g) In-house and guest lectures
h) Conferences, symposia, seminars and CMEs
i) Participations in workshops, updates, conferences
j) Teaching undergraduates
k) Use and maintenance of biomedical equipments

STRUCTURED TRAINING PROGRAMME

(Broadly conceived):

1) First Year Residency:
   a) Outpatients/inpatients care
   b) Managing medical emergencies
   c) Learning diagnostic/ therapeutic procedures and interventions
   d) Interpreting Reports
   e) Starting Dissertation
   g) Use of computers in medicine

2) Second Year Residency:
   a) Outpatients/inpatients care
   b) Rotation (six months to one year) in existing allied specialities such as Cardiology, Neurology, Endocrinology, Hematology, Nephrology and MICU.
   c) Conducting medical procedures independently.
   d) Continuation of dissertation work.

3) Third Year Residency:-
   a) Out-patients and in-patients care
   b) Independent management of emergencies
   c) Teaching junior Residents / under-graduate students enrolled in the subject
   c) Finalisation and submission of dissertation.

DISSERTATION

- The topic should be assigned to the student by the end of 6th month of enrollment.
- The topic should be communicated to the MUHS through Head of Department and Head of Institution by 7th month of enrollment.
- The duration of the study shall be upto 17 months.
- The last date of submission of the completed dissertation to the MUHS should be six months prior to the date of commencement of the degree examination.

EVALUATIONS

Regular evaluation of the postgraduate will be carried out by assessment of postgraduate activity like case presentation, seminars etc. **(appendix-2)** and evaluation at the end of each clinical posting including superspeciality postings**. (appendix- 3).** The overall performance has to be to the satisfaction of the HOD for recommendation of candidature for MD examinations.

RECOMMENDED READING

Books.-

- Harrison's Principles of Medicine
- Oxford Textbook of Medicine
- Cecil Textbook of Medicine

Reference Books:

- API Text Book of Medicine
- Wintrobe's Hematology
- Kelly's Textbook of Rheumatology
- Patten's Neurology
- Brain's Neurology
- Crofton and Douglas Respiratory Medicine
- Hepatology by Sheila Sherlock
- Electrocardiography by Shamroth
- Braunwauld's Cardiology

Journals:

- Lancet
- British Medical Journal
- Chest
- ICMR Bulletin
- WHO Bulletin
- New England Journal of medicine
- Journal of Association of Physicians of India
- Journal of Postgraduate Medicine
- Annals of Internal Medicine
- APICON Medicine Update
- Medical Clinics of North America
- Indian Practitioner
- Journal of Applied Medicine
- Journal of General Medicine

UNIVERSITY EXAMINATIONS : (*As per Direction No. 01/2008 dtd. 26/05/2008)*

Appendix-1

Diseases in General Medicine

HAEMATOLOGY

I. Red cell disorders

Approach to a patient with anemia, nutritional, iron deficiency, aplastic, megaloblastic, haemolytic anemia, (special emphasis on thalassemia & sickle cell anemia), hereditary spherocytosis, anemia of chronic disease, autoimmune hemolytic anemia, paroxysmal nocturnal hemoglobinuina, myelodysplastic syndromes, iron overload, and sideroblastic anaemias.

II. White cell disorders

Eosinophilia, febrile neutropenia, approach to a patient with splenomegaly & lymphadenopathy, lymphomas, multiple myeloma & related plasma cell disorders, leukemias , hairy cell leukemia.

III. Bleeding & coagulation disorders

Approach and investigations in patients with bleeding disorders, hemophilia, von willebrand's disease, immune thrombocytopenic purpura, vascular purpuras, henoch-schonlein purpura, thrombotic thrombocytopenic purpura, disseminated intravascular coagulation, anticoagulant and anti-platelet therapy.

IV. Miscellaneous

Approach to a patient with thrombosis, blood groups, transfusion related diseases, blood transfusion reactions, blood component therapy, hematological manifestations of systemic diseases, drug induced hematological disorders, hypersplenism, chemotherapy, bone narrow transplantation, thrombophilias, platelet function disorders, estimation of hemoglobin/ total and differential white cell count/ erythrocyte sedimentation rate, preparation and staining of blood smears.

ENDOCRINE

I. Disorders of glucose metabolism

Glucose metabolism, physiology of insulin & glucagon secretion, glucose tolerance test, diabetes mellitus, insulin preparations, hypoglycemia, glycosuria of causes other than diabetes mellitus, glucagon secreting tumors.

II. Thyroid gland & its disorders

Iodine metabolism, anatomy & physiology of thyroid gland, thyroid function tests, goiter, hypothyroidism and hyperthyroidism, myxedema, cretinism, thyroid carcinoma, other rare syndromes of thyroid dysfunction.

III. Disorders of anterior pituitary

Anatomy & physiology of various hormones & their regulation, acromegaly, gigantism, sheehan's syndrome.

IV. Disorders of posterior pituitary
Anatomy and physiology, diabetes insipidus, syndrome of inappropriate anti-diuretic hormone (SIADH) secretion, obesity.

V. Disorders of adrenal cortex
Regulation of secretion of glucocorticoids, mineralocorticoids & adrenal sex hormones, adrenal insufficiency, Cushing's syndrome, pheochromocytoma.

VI. Miscellaneous
Dwarfism, Frohlich's syndrome, Lawrence Moon Biedel syndrome, anorexia nervosa & bulimia, hypothalmus in health & disease, Conn's disease, gynaecomastia, non-puerperal galactorrhoea, multiple endocrine neoplasia syndromes, hirsutism, adreno-genital syndromes, disorders of sexual differentiation.

CARDIO–VASCULAR SYSTEM

ECG & it's interpretation, diagnosis of arrhythmias & their management, ischaemic heart disease, hypertension, rheumatic fever & rheumatic heart disease, congenital heart diseases, heart failure, pericardial diseases, peripheral vascular diseases, deep vein thrombosis, cardiomyopathies, principles of echocardiography & abnormalities in common disorders, pacemakers, nuclear medicine in cardio-vascular disorders, tumors of the heart, aneurysm & dissection of the aorta, thoracic outlet syndrome, cardiac catheterisation, cardiac interventions.

RESPIRATORY SYSTEM

Approach to a patient of respiratory system involvement, pulmonary function tests, arterial blood gases, bronchoscopy, imaging studies, pulmonary angiography, therapeutic interventions: pulmonary artery embolisation/ video assisted thoracic surgery/ thoracotomy/ mediastinoscopy, diseases of the upper airway including avian influenza, bronchial asthma, occupational lung diseases, pneumoconioses, organic dusts & environmental carcinogens, pneumonia, bronchiectasis, obstructive airways diseases, interstitial lung diseases, diseases of the pleura: effusion/ pneumothorax/ empyema/ haemothorax, air pollution, respiratory failure, adult respiratory distress syndrome, severe acute respiratory syndrome (SARS), mechanical ventilation, mediastinal diseases, infections including tuberculosis, tumors, primary and metastatic carcinomas, hypersensitivity pneumonitis, eosinophilic pneumonias, pulmonary hypertension, sleep apnea, pulmonary thromboembolism, lung transplant.

NERVOUS SYSTEM

Investigations: lumbar puncture/ cerebrospinal fluid examination/ electroencephalography/ evoked potentials/ nerve conduction studies/ electro-myography/ imaging studies/ angiography, migraine, seizures/ epilepsy, cerebrovascular diseases, sub-arachnoid haemorrhage, dementia, extra pyramidal disorders, Parkinson's disease, motor neurone disease, disorders of cranial nerves, meniers syndrome, benign positional vertigo, diseases of the spinal cord, cranio-vertebral anomalies, tumors of the nervous system, demyelinating diseases, meningitis, infections of nervous system, nutritional and metabolic disorders, central pontine myelinolysis, Wernicke's encephalopathy, alcoholic cerebral degeneration, pellagra, subacute combined degeneration, polyneuropathies, acute and chronic inflammatory demyelinating polyneuropathies, diabetic neuropathies,

mononeuritis multiplex, mononeuropathy, leprosy, neuromuscular junction disorders including myasthenia gravis, myopathies (hereditary/ endocrine/ metabolic/ thyroid diseases/ parathyroid diseases/ diabetes mellitis), periodic paralysis, approach to a patient paralysis, dizziness & vertigo, diplopia, syncope and transient loss of consciousness, involuntary movements, delerium, ataxia, parasthesias & sensory loss, unconsciousness, bowel & bladder abnormalities, progressive supranuclear palsy, dystonia, spinocerebeller ataxia, drug induced movement disorders, inherited ataxia, traumatic injuries, subdural & epidural hematoma, radiation & chemotherapy in treatment of nervous system tumours, subdural empyema, progressive multifocal leucoencephalopathy, subacute sclerosing pan encephalitis, progressive rubella, panencephalitis, kuru, molecular treatment of neurological disorders, disorders of the autonomic nervous system, details of traumatic injuries to skull & spine, hereditary & metabolic disorders of late onset, mitochondrial myopathies, lipid storage disorders.

INFECTIOUS DISEASES

Sepsis syndromes, pyrexia of unknown origin, infective endocarditis, acute infectious diarrhoeal diseases & food poisoning, infections of the urinary tract, infections of skin/ muscle/ soft tissues, infections in intravenous drug abusers, hospital acquired infections, infection control in hospital, bacterial infections, specific infections: pneumococcal/ staphyloccal/ tetanus/ streptococcal/ diphtheria/ botulism/ gas gangrene/ meningococcal/ gonococcal/ salmonella/ shigella/ vibrio cholera/ brucella/ plague/ syphilis/ mycobacteria/ leptospira/ mycoplasma/ pseudomonas/ helicobacter pylori, viruses: herpes/ varicella/ ebstein barr virus/ cytomegalo virus/ rabies/ respiratory viruses/ influenza/ measles/ mumps/ rubella/ arboviruses, fungal: candidiasis/ aspergillosis/ mucormycosis, parasites: ameobiasis/ giardiasis/ pneumocystis carinii/ malaria/ leishnianiasis/ cryptosporidium/ microspondium/ isospora/ filariasis/ neurocysticerosis/ worm infestations, tropical diseases, pancreatitis, osteomyelitis, infections due to bites/ scratches/ burns, tularemia, pertussis, bartonellosis, arenaviruses, moraxella, legionella, nocardia, actinomycetes, borellia, chlamydiae, rickettsia, newer emerging infections: avian influenza, chikungunya, others.

HIV/AIDS: Aetiology & pathogenesis, clinical presentations, modes of transmission, universal precautions, opportunistic infections, management and treatment of the disease, opportunistic infections, complications, anti-retroviral therapy, prophylaxis: post exposure and of opportunistic infections, recent advances, historical record.

HEPATO-BILIARY SYSTEM

Liver function tests, jaundice, hepatitis, cirrhosis of liver, portal hypertension, hepatic encephalopathy, hematemesis, amoebic hepatitis, granulomatous hepatitis, hydatid cyst, primary and metastic carcinomas, liver transplant, gall bladder diseases: cholelithiasis/ cholecystitis/ diseases of bile-duct/ cholangiocarcinoma.

GASTROINTESTENAL TRACT

Peptic ulcer disease, gastrointestinal bleeding, gastritis, endoscopy, radiological procedures, infections, inflammatory bowel disease, functional gut disorders, motility disorders, malabsorption syndromes, pancreatitis, cystic fibrosis, malignancy.

KIDNEY

Renal failure, renal replacement therapies, hematuria, proteinuria, polyuria, oliguria, anuria, contrast nephropathy, urinary tract infections, glomerulonephritis, nephrotic syndromes, tubulo-interstitial diseases, kidney in systemic diseases, tumours of the urinary tract, renal calculous disease, barter's syndrome, fabry's disease, malignancy.

GERIATRIC MEDICINE

Theories of ageing, demographic patterns (world / Asia / India) and their significance to health care system, physiological changes in the elderly, diseases in elderly, pharmaco-therapy in the elderly, rehabilitation, physiotherapy, occupational therapy, psychotherapy, legal aspects (elderly abuse), psychiatric illnesses in elderly population, geriatric assessment, geriatric emergencies.

GRANULOMATOUS DISEASES

Tuberculosis, leprosy, syphilis, sarcoidosis, Wegener's granulomatosis, histoplasmosis, coccidoidomycosis, mucocutaneous leishmeniasis, midline granuloma, lymphomatous granuloma, pseudotumor of the orbit.

ETHICAL & LEGAL ISSUES IN MEDICINE

Importance and procedures of informed consent, emergency & life saving intervention & treatment, information to be given to patient & relatives, rights of patients including confidentiality, withdrawing life support systems, organ transplant from cadaver, euthanasia, consumers protection act, clinical decisions for a patient who lacks decision of signing of will, ethics committee & its role in medical research, procedures (medico legal) followed in cases of poisoning, suspected rape, adverse reaction to drugs and interventions, absconded patients, in-hospital injuries and suicide, treatment of pregnant patients with drug and interventions likely to cause fetal harm, cloning, stem cells usage and preservation, crimes performed by addicts.

POISONINGS

Diagnosis and management of specific and unknown poisonings, universal & specific antidotes, acids and alkalis, kerosene, petroleum products, organophosphates and carbamates, household disinfectants, mosquito repellants, aluminium phosphide, zinc phosphide, yellow phosphorus, heavy metals, paracetamol, barbiturates, snake and scorpion bites, botulism, drug over-dosages, international classification of poisonous chemicals, environmental hazards and poisonings, industrial toxicology, toxidromes, nuclear, biological, chemical warfare.

PREGNANCY MEDICINE

Maternal & foetal physiology, principles of maternal morbidity & fetal outcome, medical disorders during pregnancy, infections in pregnancy, metabolic disorders, hyponatremia, thyroid disorder, hypertension and eclampsia, renal failure, disseminated intravascular coagulation, diabetes, valvular heart disease, bronchial asthma, cardiomyopathies,

jaundice, HIV/AIDS, hypercoagulable state and its sequelae and complications, cortical venous sinus thrombosis in pregnancy, post partum sepsis, aminotic fluid embolisation, Epilepsy, drugs in pregnancy, poisonings in pregnancy, smoking, alcoholism, surgery and pregnancy, psychiatric diseases in pregnancy, medical disorders and infertility, genetic disorders & genetic counseling, ethical issues in pregnancy (brain death).

RADIOLOGY

Roengenograms of chest/ abdomen/ spine/ skull/ paranasal sinuses/ bones and joints, computerized tomography (CT) and magnetic resonance (MR) imagings, angiography, digital substraction angiography, imaging techniques for hepatobiliary system, barium studies, intravenous urography, scintigraphy, radionuclide imaging of kidney/ bone/ heart/ liver/ lung/ gall bladder/ thyroid/ parathyroid/ whole body, echocardiography, ventriculography, positron emission tomography (PET) scan, lymphangiography, cardiac catheterization, ultrasound, color doppler, developing and newer imaging techniques.

DISORDERS BONE & MINERAL METABOLISM

Calcium and phosphorous homeostasis, parathroid gland disorders, vitamin-D in health & disease, metabolic bone disease, osteoprosis, osteomalacia, endocrine hormonal influences on bone metabolism, phosphorus metabolism, hypophosphatemia, hyperphosphatemia, disorders of magnesium metabolism, Pãget's disease of bone, osteomyelitis, bone dysplasias, osteoarthritis, spondylosis, bone in systemic diseases.

IMMUNOLOGY

Normal immune system and its functions, hypersensitivity reactions, T-cell mediated diseases, mechanism of tissue damage, cytokine mediated injury, cytokine inhibitors, interaction of T and B cells, complement system, apoptosis, immunotherapy, immuno-modulators, immunosuppressive agents, monoclonal antibodies, stem cell transplant in immune disorders, HLA system, primary immune deficiency diseases, amyloidosis, disorders of immediate type hypersensitivity, biological response modifiers, immunologically mediated skin disorders.

RHEUMATOLOGY

Pathophysiology of inflammation, autoantibody revelance in disease processes, rheumatoid arthritis including extra-articular manifestations, glucocorticoid therapy in connective tissue diseases, systemic lupus erythematosis (SLE), organ targeted therapy, vasculitides, ankylosing spondylitis, reactive arthritis, undifferentiated spondyloarthropathy, polyarteritis nodosa, Wegener's granulomatosis, Churg Strauss disease, Takayasu's arteritis, cutaneous vasculitis, imaging techniques in systemic vasculitis, approach to acute and chronic monoarthritis & polyarthritis, diagnostic imaging in joint disease, crystal arthropathies, gout, infectious arthritis, infections in patients with connective tissue diseases, anti-phospholipid antibody syndrome (APLA), drug induced rheumatic diseases, scleroderma, sarcoidosis, fibromyalgias, haemophilic arthropathy, dermatomyositis, polymyositis, overlap syndromes, sjogrens syndrome, calcium oxalate deposition disease, psoriatic arthritis, neuropathic joint disease, osteo-arthritis.

FLUID& ELECTROLYTE

Choice of intravenous fluids, plasma expanders, potassium/ calcium/ sodium/ magnesium/ phosphate disorders, acid base balance and disorders.

CRITICAL CARE

Cardio-pulmonary resuscitation, non-invasive and invasive cardiovascular monitoring, circulatory failure, heart failure, acute myocardial infarction, pulmonary embolism, respiratory failure, pulmonary aspiration, nosocomial pneumonia, mechanical ventilation, toxicology, renal failure, status epilepticus, Guillian Barre syndrome, myaesthenia, use of blood products, intravenous immunoglobulins, plasmapheresis, hyperthermia, hypothermia, diabetic ketoacidosis, addisonian crisis, myxedema coma, endotrachial intubation, pacemakers, strokes, subarachnoid haemorrhage, near-drowning, circulatory and ventilatory support in adult respiratory distress syndrome (ARDS), asthma, obstructive airways disease, renal replacement therapy.

EMERGENCY MEDICINE

Basic and advanced life support, disaster management, use and maintenance of equipment used in life support, acute sever asthma, status epilepticus, poisonings, heart failure, shock, acute myocardial infarction, angina, arrhythmias, hypertensive emergencies, medical emergencies in pregnancy, gastro-intestinal bleeding, hepatic encephalopathy, acute gastroenteritis, hemoptyses, obstructive airways disease, tension pneumothorax, adult respiratory distress syndrome (ARDS), respiratory failure, cor-pulmonale, stroke, sub-arachnoid haemorrhage, oliguria/ anuria, coma, pneumonia, meningitis, infections, sepsis syndromes, multi-organ failure, bleeding manifestations, endocrine emergencies, electric shock, poisonings, snakebite, scorpion stings, anaphylaxis, nuclear/ biological/ chemical exposures, toxidromes, rabies, burns, strangulation, interventions and procedures: mechanical ventilation/ temporary cardiac pacing/ invasive monitoring/ needle and tube thoracostomy/ cricothyrotomy.

Appendix -2

PG - ACTIVITY ASSESSMENT SHEET

Student's Name……. Date……..

PG – CLINIC (Case presentation)

a. History & Examination
b. Investigations
c. Diagnosis & Clinical co-relation
d. Management
e. Questions & Answers

CLINICAL SEMINAR (Case discussion)
a. Case details
b. Discussion (content, update references, etc)

c. Presentation (Clarity, time, language, etc)
d. Audio-visual aides
e. Questions & Answers

SEMINAR (Problem/ syndrome based discussion)
a. Content
b. Update with references
c. Presentation (Clarity, time, language. etc)
d. Audio-visual aides
e. Questions & Answers

Appendix 3

CLINICAL WORK EVALUATION SHEET

For posting under one Unit (including super-specialty postings)
Student's Name ……. Posting period. ……to …….

Points for Assessment:
1. Punctuality and discipline
2. Quality of Ward-work
3. Maintenance of Case-Records
4. Presentation of cases in Rounds
5. Investigation Work-up
6. Bedside manners
7. Rapport with the patients
8. Rapport with Colleagues
9. Undergraduate Teaching (if applicable)
10. Counseling patient's relatives

Name of the Unit head Signature
Dated

Passed by Academic Council (Resolution No. 355/2006) dtd. 30/05/2006, subject to Uniformity in the Examination pattern.

Department of Pediatrics

Curriculum

For

Post-graduate Degree Course
M.D. (Pediatric Medicine)

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1. Goal

The Goal of M.D. (Pediatrics) Program is to provide training in Pediatrics and Neonatology to produce competent specialists who are able to provide basic and speciality care of the highest order to neonates, infants, children and adolescents at the community level and at primary, secondary and tertiary levels of health care, and to act as future trainers, teachers, and researchers in the field of Pediatrics and Neonatology.

2. Course Description

MD (Pediatrics)

Duration: 3 years

Eligibility: MBBS

3. Intramural and Extramural Rotation

MD (Pediatrics):

- At least 4 and not more that 8 months in Neonatology.
- At least 3 and not more than 6 months in sub-speciality areas: Intensive Pediatric Care Unit (IPCU), Genetic Clinic, Thalassemia Care Centre, Emergency Pediatric Services.
- At least nil and maximum 6 months in Allied areas: Hematology, Infectious Diseases, Dermatology, Cardiology, Nephrology, Chest Medicine, Gastroenterology.

The Department of Pediatrics will decide the posting of students in Neonatology and Allied Branches and Sub- speciality areas.

4. Syllabus

I) Basic Sciences and Laboratory Medicine as applied to Pediatrics and Childhood Diseases.

II) Clinical Epidemiology

III) Ethics in Pediatrics and Child Care

IV) Computers in Pediatrics

V) Pediatric and Neonatal Therapeutics

- Effects of physical and physiological changes on the pharmacokinetics of commonly used medications in Pediatrics.
- Recognition of drugs that are contraindicated, and used with extreme caution in specific pediatric populations.
- Effects of maternal therapy on the fetus and the neonate.
- Secretion of drugs in the breast-milk.
- Patient education and parent education for appropriate drug dosing, formulations and administration techniques.

VI) Preventive Pediatrics

- National Health programs relevant to Pediatrics and Child Care.
- Epidemiology of common health problems and diseases.
- Vital statistics: Maternal Mortality Rate, Perinatal Mortality Rate, Neonatal Mortality Rate, Under-5 mortality Rate: Definitions, National Status, Determinants, Interventions aimed at reduction of the rates.
- National Immunization Programs and policies.
- Other vaccines not included in national immunization program.

VII) Social Pediatrics

- Child labour, Child abuse, Child neglect, Failure to thrive, Social issues relevant to Pediatrics.
- Media and children
- Children at special risk
- Adoption
- Environmental health hazards.

VIII) Psychological Behavioral manifestations disorders

- Identification and assessment of Psychological and behavioral disorders.
- Intervention and management strategies for Psychological and behavioral disorders.

IX) Growth and Development

- Normal pattern and factors affecting growth and development. Recognition of normal variants of growth and development.
- Developmental assessment in infancy and childhood.
- Physiological changes during adolescence and problems facing adolescents.
- Assessment of growth.
- Deviations from normal patterns of growth and development: Recognition, Prevention, Early intervention and Management.
- Tools for assessment of growth and development at various ages including Indian adaptations.

X) Nutrition

- Understanding of energy balance in humans.
- Basic biochemistry of proteins, carbohydrates and fats.
- Proximate Principles, Vitamins, Minerals and Micronutrients: Biochemistry, Physiological Functions, Daily Requirements, Manifestations and Management of deficiency and excess states.
- Normal requirement of protein, fat, carbohydrate for newborns, children, adolescents and pregnant and lactating women.
- Nutritional values of common Indian foods.
- Breastfeeding and lactation management
- Infant feeding and weaning foods.
- Balanced diet.
- Assessment of nutritional status.
- Nutritional disorders-Etiology, Clinical features, patho-physiology, pathogenesis and management
- Pathological features of various nutritional disorders.
- Planning of diet during illness.
- Total parental nutrition.

XI) Fluids and Electrolytes

Pathophysiology of body fluids, fluid therapy, electrolytes, acid-base balance, parenteral and enteral fluid therapy

XII) Emergency pediatric services

- Pediatric resuscitation
- Evaluation of critically ill child.
- Pediatric Emergencies and poisoning.
- Pediatric injuries and injury control and accidents.
- Insect, animal and snakebites.
- Planning and management of pediatric intensive care unit
- Anesthesia, perioperative care and pain management.
- Principles of drug therapy.

XIII) Genetics

- Principles and molecular basis of genetic disorders.
- Clinical features and management of genetic and chromosomal disorders.
- Prenatal diagnostic techniques and neonatal screening tests.
- Effects of teratogenic agents.
- Genetic counseling.
- Gene therapy.

XIV) Metabolic diseases

Metabolic diseases of protein (amino acids), carbohydrates, fats, mucopolysaccharides, purines, pyrimidines, heme and others

XV) Neonatology: The fetus and neonatal infant

- High-risk pregnancy
- Assessment of fetal growth, wellbeing and maturity.
- Fetal distress: Manifestation, identification and management
- Maternal diseases and their effects on the fetus and newborn.
- Assessment of fetal wellbeing.
- Identification and management of various fetal diseases.
- High-risk infant – identification and management.

- Delivery room emergencies, resuscitation of newborn and care of normal new born.
- Birth injuries.
- Adaptation of newborn.
- Examination of newborn and assessment of maturity.
- Etiology, clinical features, pathophysiology, pathogenesis and management of various diseases of newborn.
- Neonatal transport.
- Neonatal procedures.
- Developmental assessment, and early intervention programmes for infants at high risk for developmental delay.
- Care of newborn in the community.
- Planning and organization of level I, level II, Level III Neonatal care centers.

XVI) Infectious diseases

- Clinical features, management of viral, bacterial, fungal, spirochetal, rickettsial, parasitic, protozoal and other infections.
- Prevention and management of nosocomial infections.
- Infection control and preventive measures.
- Immunization against infections diseases.
- Fever
- Laboratory techniques for diagnosis of infections diseases.
- Infections in immunocompromized host.
- Clinical syndromes caused by various infections agents.

XVII) Immunological system and its disorders

- Components of immune system and their functions.
- Disorders of immune system – Etiology, Clinical features, pathophysiology, pathogenesis and management.
- Pharmacotherapy.
- Transplantation medicine.
- Allergic diseases – etiology, clinical features, patho-physiology, pathogenesis and management.
- Relevant diagnostic and therapeutic modalities in various immunological and allergic disorders.

XVIII) Rheumatic diseases and connective tissue disorder of childhood.

Etiology, pathogenesis, manifestation, laboratory diagnosis and management of Rheumatic diseases in childhood and adolescents

XIX) Respiratory system

- Development of respiratory system, congenital anomalies.
- Physiology of respiration and mechanics of ventilation.
- Etiology, clinical features, pathophysiology, pathogenesis and management of various respiratory diseases.
- Pathological features of various respiratory diseases.
- Relevant diagnostic and therapeutic modalities in respiratory diseases in children.
- Pharmacotherapy of respiratory diseases.

XX) Cardiovascular system

- Embryology of heart and vascular system.
- Adaptations of cardiovascular system at and after birth.
- Etiology, pathophysiology, pathogenesis, clinical features and management of congenital and acquired heart and vascular diseases and rheumatic heart disease.
- Rheumatic fever – Epidemiology, clinical features, pathophysiology, pathogenesis, prevention and management.
- Relevant diagnostic and therapeutic modalities in heart diseases in children.
- Congestive cardiac failure – Etiology, pathophysiology, pathogenesis, clinical features and management.
- Pharmacotherapy of cardiovascular diseases.

XXI) Gastrointestinal tract

- Development of gastrointestinal tract, hepatobiliary system and their abnormalities.
- Physiology of digestion.
- Etiology, pathophysiology, pathogenesis, clinical features and management of various gastrointestinal and hepatobiliary and other abdominal diseases.
- Pathological features of gastrointestinal, hepatobiliary and pancreatic disorders.
- Surgical emergencies in gastrointestinal tract diseases.

XXII) Hematology and Neoplastic diseases

- Physiology of erythropoiesis, leukopoiesis and physiology of hemostasis.
- Etiology, pathophysiology, pathogenesis, clinical features and management of hematological and oncological diseases.
- Laboratory diagnosis and other relevant diagnostic and therapeutic modalities in hematological and oncological disorders.
- Pharmacotherapy of Hematological and Oncological Diseases.
- Component therapy in Pediatric Practice.

XXII) Nephrology and genitourinary tract

- Development and developmental anomalies of the kidneys and the genitourinary tract.
- Physiology of urine formation and metabolic functions of the kidney.
- Etiology, pathophysiology, pathogenesis, clinical features and management of various disorders of the kidney and the genitourinary tract.
- Pathological features of diseases of the kidney and genitourinary tract.
- Relevant diagnostic and therapeutic modalities for diseases of the kidney and the genitourinary tract.
- Pharmacotherapy of renal and genitourinary disorders.
- Management of end stage renal disease.

XXIV) Central and peripheral Nervous System

- Development of the brain, spinal cord and peripheral nervous system and their anomalies.
- Neurological evaluation of newborns, infants and children.
- Etiology, pathophysiology, pathogenesis, clinical features and management of various diseases affecting central nervous system and peripheral nervous system.
- Seizures in childhood.
- Neuromuscular diseases – etiology, clinical features, pathophysiology and management.

XXV) Endocrine system

- Synthesis, physiological functions and pharmacological actions of various hormones.
- Disorders of the endocrine glands.
- Pubertal development and its disorders.

XXVI) Congenital and acquired disorders of eye, ear, nose, throat, bones and joints.

XXVII) Miscellaneous diseases

- Unclassified diseases including SIDS, Sarcoidosis, Progeria histiocytosis, chronic fatigue syndrome.
- Metabolic bone diseases.
- Genetic skeletal dysplasias.

XXVII) Development of diagnostic approach for and interpretation of symptomatology and clinical signs in infants, children and adolescents.

XXVIII) Basics of Research Methodologies and Ethical aspects of Clinical Research

5. List of skills

1. Elicitation of history from parents, guardians, relatives and patients regarding complaints previous diseases and therapy, events around birth, prenatal period, growth and development, diet and immunization, socio-educational and economic background and other relevant aspects.
2. Conduct physical examination of well and sick newborn babies, infants, children, adolescents and adults.
3. Accurately measure length or height, weight, head circumference and plot the data on an appropriate chart.
4. Accurately measure mid-arm circumference of children aged 1-5 years.
5. Identify abnormal growth patterns.
6. Interpret data obtained by anthropometric measurement and developmental assessment.
7. Assess nutritional status and determine if the child is getting adequate nutrition.
8. Provide nutritional advice for newborn babies, infants, children and adolescents.
9. Provide advice regarding breast-feeding, weaning and balanced diet.
10. Provide advice regarding healthy & hygienic practices with a view to prevent diseases, disorders, injuries, accidents and poisoning.
11. Develop a diagnostic approach for clinical problems in newborns, infants, children and adolescents.
12. Discuss the characteristics of the patient and of the illness that must be considered when making the decision to manage the patient in the outpatient setting or admit to hospital.
13. Discuss the differential diagnosis of symptoms, signs and presentations in neonates, infants, children and adolescents.
14. Undertake relevant investigations for diagnostic and prognostic evaluation taking into consideration the risks, benefits and costs involved.
15. Convince parents and guardians regarding undertaking investigations and obtain their co-operation and valid legal consent.
16. Interpretation of laboratory Reports.

Counseling parents regarding the child's health status, health needs, illness & disabilities

17. Performance of Diagnostic & Therapeutic Procedures:

- Venepuncture (10)
- Intravenous access for administration of drugs and intravenous fluids (10)
- Administration of drugs via intra-dermal, intra-muscular or subcutaneous routes (5 each)
- Administration of drugs and fluids through intra-osseous route (2)
- Lumbar puncture to draw out cerebro-spinal fluid for examination (5)
- Sub-dural tap (2)
- Ventricular tap (1)
- Peritoneal (Ascitic) tap for diagnostic and therapeutic purposes (2)
- Pleural tap for diagnostic and therapeutic purposes (4)
- Collection of blood from an artery for arterial blood gas analysis (4)
- Obtaining Central IV Access (3)
- End tracheal Intubation in Newborn babies, Infants, Children & Adolescents (5)
- Cardiopulmonary Resuscitation (5)
- Supra-pubic tap for obtaining a urine sample (5)
- Administration of drugs via a nebulizer (5)
- Catheterization of the urinary Bladder (5)
- Liver Biopsy (4)
- Kidney Biopsy (2)
- Arterial Cannulation for monitoring of Blood Pressure (5)
- Peritoneal dialysis (2)
- Cannulation of the umbilical vessels (7)
- Exchange Transfusion (5)
- Bone Marrow aspiration (2)
- Bone Marrow Biopsy (2)
- Pericardiocentesis (2)
- Cardioversion (4)

(The numbers in the brackets indicate the minimum number of the procedure that a post-graduate student needs to observe/ assist/ perform/ supervise)

6. Teaching/Learning Activities and Opportunities

Inpatient management

Outpatient Management

Presentation of cases on Clinical Rounds

Topic presentation.

Case discussions.

Clinicopathological conferences.

Clinicoradiological conferences.

Biopsy Meetings.

Mortality Review Meetings

Journal Club

Guest Lectures

In-house lectures

Conferences,

Seminars.

CME sessions

Participation in Workshops

Presentation of Papers

Teaching Undergraduate students.

Teaching Postgraduate students & paramedical staff.

Use and Maintenance of biomedical equipments and gadgets

Counseling regarding performance of procedures, disease process and prognostication

Group discussions Sessions

Assisting in diagnostic and therapeutic procedures.

Performing diagnostic and therapeutic procedures.

Patient/Health education.

7. Research

All the postgraduate students will be exposed to Research Methodologies through their participation in the Journal Club.

A candidate registered for M.D. (Pediatrics) will be submitting a dissertation to the university. This will be a pre-requisite for appearing for the MD examination. The dissertation will be done under the guidance and full satisfaction of the post-graduate teacher under whom the candidate is registered.

8. Reference Books and Suggested Reading

(A) Books & Textbooks

(I) General Medicine & Pediatrics

- Nelson Textbook of Pediatrics (Behrman)
- Forfar Textbook of Pediatrics (Campbell).
- Rudolph's Pediatrics (Rudolph).
- Pediatric Medicine (Avery).
- Textbook of Pediatrics (Udani).
- Manual of Pediatric therapeutics (Graef).
- Manual of Neonatal Care (Cloherty)
- Common symptoms (Illingworth).
- Pediatric diagnosis (Green).
- Signs and symptoms in Pediatrics (Tunnessen).
- Harrison's Principles of Internal Medicine.
- Mcleod's clinical methods.
- IAP Textbook of Pediatrics
- Harriet Lane Handbook (Barone).
- Handbook of Pediatric Physical diagnosis (Barness)

(II) Super-speciality Reference Books

Neurology : Pediatric Neurology : Principles and Practice(Swaiman)
Clinical Pediatric Neurology :A Signs and symptoms approach (Fenichel)

Nephrology: Pediatric kidney diseases (Edelmann).
Pediatric Nephrology (Holliday).
Clinical Pediatric Nephrology (Kher & Makker).

Cardiology: Nada's Pediatric Cardiology (Fyker).
Heart Disease in Infants, children and Adolescents (Adams-Moss's).
Rheumatic fever (Markowitz).
Peroiff - Pediatric Cardiology for Practitioner's (Myung Park).
How to read Pediatric ECGs (Park).

Hematology: Clinical hematology in medical practice (de Gruchy's).
Blood diseases of infancy and childhood (Miller).
Nathan & Oski's Hematology of Infancy and childhood (Nathan).
Living with Thalassemia (Aggarwal)

Gastroenterology: Pediatric Gastroenterology (Sheila Sherlock)
Liver disorders in childhood (Mowat)
Paediatric Gastroenterology (Anderson).

Respiratory: Kendig's disorders of the respiratory tract in children (Chernick).

Infectious Diseases & Parasitology:
Poliomyelitis (Huckstep).
Tuberculosis in Children. (Miller)
Essentials of Tuberculosis in children. (Vimlesh Sheth)
Parasitology (Charterjee)
Textbook of Pediatric Infections diseases(Fegin & Cherry)

Growth & Development :
The Development of the Infant and Young Child – Normal & Abnormal (Illingworth)
The Normal Child (Illingworth).

Miscellaneous : Protein Energy Malnutrition
a) Alleyne,
b) Waterlow.
Essentials of Human Genetics (Kothari & Mehta)
Genetics in Medicine (Thomson & Thomson).
Birth Defects encyclopedia (Buyses).
Smith's Recognizable Patterns of Human Malformation (Jones).
Breastfeeding – A Guide for the medical profession (Lawrence)
Medical Embryology (Langman).
Frontiers in social Pediatrics (Patwari)
Medical emergencies in children (Singh)

Immunization : Immunization in Practice (Mittal)
Immunization update (Mittal)

(B) Journals in Pediatrics & Other Periodicals

Year Book of Pediatrics – Stockman III

Indian Pediatrics

Indian Journal of Pediatrics

Pediatrics Today.

Archives of Diseases in Childhood

Pediatrics

Journal of Pediatrics

Drugs.

State of the World's Children (UNICEF)

Perinatology Clinics of North America

Recent Advances in Pediatrics

Advances in Pediatrics

Recent Advances in Pediatrics – Suraj Gupte (Ed.)

(C) Sub-speciality Journals

Pediatric Nephrology

Pediatric Cardiology

Pediatric Neurology

Pediatric Radiology

Pediatric Neurosurgery

Journal of Infection

9. Evaluation Form

(A) Postgraduate Seminars

Name: Date:

Seminar Topic:

Evaluation Points:

1. Presentation:
2. Completeness of Preparation:
3. Cogency of presentation:
4. Use of audiovisual aids.
5. Understanding of subjects:
6. Ability to answer questions:
7. Time scheduling:
8. Consulted all relevant literature:
9. Overall performance.

Guidance for Scoring	**0**	**1**	**2**	**3**	**4**
	Poor	**Below average**	**Average**	**Above average**	**Very Good**

Faculty members:

1.

2.

3.

Mean Score:

Evaluation Form

(B) Case Presentation

Name: Date:
Case Title:

1. Logical order in presentation:
2. Cogency of presentation:
3. Complete /Relevant history:
4. Accuracy of General Physical Examination:

   All signs elicited correctly.
5. Accuracy of Systemic Examination:
6. Diagnosis – Logical flow based on History & findings:
7. Order of differential diagnosis (logical):
8. Investigations required:

   (Complete list, Relevant order, Interpretation of investigations, Unnecessarily investigations asked)
9. Treatment: Principles & details
10. Patient/Relatives communication

    (Diagnosis & Management
    Health education)

Overall:

1. Abilities to react to questioning:
2. Abilities to defend diagnosis:
3. Ability to justify differential diagnosis:
4. Acceptability of plan of management
5. Confidence

Score	**0**	**1**	**2**	**3**	**4**
	Poor	**Below average**	**Average**	**Above average**	**Very Good**

Faculty members:

1.

2.

3.

Mean Score:

Evaluation Sheet
(C) Journal Club

Name: Date:

Points for consideration: Score

1. Choice of article relevant:
2. Cogency of presentation:
3. Whether understood and conveyed the purpose of the article:
4. How did he defend article:
5. Whether cross references have seen consulted:
6. Understood explained basics of statistic in article:
7. Whether relevant information mentioned from other similar articles.
8. Use of audio visual aids:
9. Presentation:
10. Response to questioning:

Score	**0**	**1**	**2**	**3**	**4**
	Poor	**Below average**	**Average**	**Above average**	**Very Good**

Faculty members:

1.

2.

3.

Mean Score:

Evaluation Form

(D) Clinical Work

Name: Date:

Points to be considered:

1. Punctuality:
2. Regularity of attendance:
3. Quality of ward work (procedures):
4. Maintenance of case records:
5. Presentation of cases during rounds (approach):
6. Investigation work up:
7. Bedside manners:
8. Rapport with patients:
9. Rapport with colleagues:
10. Motivation for blood donation:
11. UG teaching (if applicable):
12. Counseling patient's relatives:
13. Management of emergencies:
14. Knowledge of Pediatrics as a subject:

Score	**0**	**1**	**2**	**3**	**4**
	Poor	**Below average**	**Average**	**Above average**	**Very Good**

Faculty members:

1.

2.

3.

Mean Score:

NATIONAL MEDICAL COMMISSION
Postgraduate Medical Education Board

D 11011/1/22/AC/Guidelines/22 **Date: 02-11-2022**

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GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR M.D. IN PATHOLOGY

GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR MD IN PATHOLOGY

Preamble

The purpose of PG education is to create specialists who would provide high quality health care and advance the cause of science through research & training.

This programme is meant to standardize Pathology teaching at postgraduate level throughout the country in order to achieve uniformity in teaching and create suitable manpower with appropriate expertise. The postgraduate student in pathology should be sufficiently trained, professionally competent and confident in handling, ~~and~~ processing, and diagnosis related to histopathology (surgical pathology), cytopathology, and hematology with reasonable working knowledge in blood banking, laboratory medicine, medical statistics, and ancillary techniques with understanding of general principles and methodology.

The purpose of this document is to provide teachers and learners illustrative guidelines to achieve defined outcomes through learning and assessment. This document was prepared by various subject-content specialists. The Reconciliation Board cum Expert group of NMC has attempted to render uniformity without compromise to the purpose and content of the document. Compromise in purity of syntax has been made in order to preserve the purpose and content. This has necessitated retention of "domains of learning" under the heading "competencies".

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SUBJECT SPECIFIC LEARNING OBJECTIVES

At the end of the MD training programme in Pathology, the student should achieve the following goals:

1. Knowledge of Pathology

1.1. Make a diagnosis based on histopathology (surgical pathology) and cytopathology specimens, blood and bone marrow examination and various tests of Laboratory Medicine (clinical pathology, clinical biochemistry) as well as Blood Banking (Transfusion Medicine).

1.2. Interpret clinical and laboratory data with reasonable accuracy and prepare a succinct and lucid report

1.3. Compose reports following standard protocols including synoptic reporting

1.4. Interpret and correlate clinical and laboratory data so that clinical manifestations of diseases can be explained.

1.5. Advise on the selection of appropriate specimens and tests necessary to arrive at a diagnosis in a problematic case including molecular tests.

1.6. Correlate clinical and laboratory findings with pathology findings at autopsy, identify miscorrelations and the causes of death due to diseases (apart from purely metabolic causes).

1.7. Maintain quality control of all tests by being part of Internal Quality Control Monitoring program.

1.8. Make and record observations systematically and maintain accurate records of tests and their results for reasonable periods of time. Identify problems in the laboratory, offer solutions thereof and maintain a high order of quality control.

1.9. Should be aware of safe and effective disposal of laboratory waste and ensure minimization risk of exposure to infection and accidents to laboratory personnel.

2. Teaching and training

2.1. Should be able to teach Pathology to undergraduates, postgraduates, nurses and paramedical staff including laboratory personnel.

2.2. The postgraduate student should be able to teach effectively and assess undergraduate medical and allied health science students so that they become competent healthcare professionals.

3. Research

3.1. Plan, execute, analyze, and present research work independently or as part of a team.

3.2. The postgraduate student in Pathology should acquire knowledge and skills to be able to conduct a research project from the planning to the publication stage and become a life-long learner.

4. Professionalism, Ethics and Communication skills

4.1. The postgraduate student should learn and apply principles of professionalism, ethics, and effective communication in conduct of routine pathology services, research, and routine work.

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SUBJECT SPECIFIC COMPETENCIES

A. COGNITIVE DOMAIN

A postgraduate student upon successfully qualifying the MD (Pathology) examination should have acquired the following BROAD theoretical competencies and should be:

- Capable of offering an accurate diagnostic opinion in a given clinical situation with an appropriate and relevant sample of tissue, blood, body fluid, etc. for the purpose of diagnosis.
- Conversant with the standard operating procedures of various laboratories including histopathology, cytopathology, hematology and laboratory medicine
- Able to teach and share his knowledge and competence with others. The student should be imparted training in teaching methods in the subject which may enable the student to take up teaching assignments in Medical Colleges/Institutes.
- Capable of pursuing clinical and laboratory-based research. He/she should be introduced to basic research methodology so that he/she can conduct fundamental and applied research.

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At the end of the course, **the student should have acquired the following competencies as a diagnostician:**

Surgical pathology

- Be conversant in the histogenesis and pathophysiological processes associated with various diseases.
- Should be able to identify problems in the histopathology laboratory and offer viable solutions.
- Possess the background knowledge necessary for the evaluation and reporting of Surgical Pathology.
- Conversant with the various equipment used in the histopathology laboratory.
- Should have knowledge of automation and quality assurance in histopathology.

Cytopathology

- Possess the background knowledge necessary for the evaluation and reporting of Cytopathology.

- Demonstrate familiarity with, and guide clinical/radiology residents in keeping with the clinical information on the choice of site, collection, preservation, transport, type of preparation and method of obtaining various cytological specimens.
- Conversant with the various equipment used in the cytopathology laboratory.
- Should have knowledge of automation and quality assurance in cytopathology.

Hematology

- Demonstrate ability to utilize the principles of the practice of Hematology for the planning of tests, interpretation, and diagnosis of diseases of the blood and bone marrow.
- Conversant with the various equipment used in the hematology laboratory.
- Should have knowledge of automation and quality assurance in hematology.

Laboratory medicine

- Demonstrate familiarity with the normal range of values of the chemical content of body fluids, significance of altered values, and interpretation thereof.
- Possess knowledge of the following specialized organ function tests and relative utility and limitations of each and significance of altered values:
  (i) Renal function test
  (ii) Liver function test
  (iii) Endocrine function test
  (iv) Tests for malabsorption
- Principles, advantage and disadvantages, scope, and limitation of automation in laboratory.
- Learn the principle and methodology of quality control in the laboratory.

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Transfusion medicine

- Possess knowledge of basic immunology, ABO and Rh groups, minor blood groups and their clinical significance, transfusion therapy, pre-transfusion testing, transfusion related infections, transfusion reactions and quality control in blood bank.

Autopsy pathology

- Conversant with the technique of autopsy.
- Possess sufficient understanding of the various disease processes so that meaningful clinico-pathological correlation can be made.

Immunopathology

- Demonstrate familiarity with current concepts of structure and function of the immune system, its aberrations, and mechanisms thereof.
- Demonstrate familiarity with the scope, principles, limitations, and interpretations of the results of ELISA techniques, HLA typing, immunofluorescence, and immunoelectrophoresis.

Immunohistochemistry and flow cytometry

- Demonstrate familiarity with the principles and procedures of performing immunohistochemistry including automation in procedure and interpretation.
- Demonstrate familiarity with the principles and procedures of performing flow cytometry.

Cytogenetics and Molecular biology

- Demonstrate familiarity with the principles of molecular biopsy especially related to the understanding of disease processes and its use in various diagnostic tests at least including but not limited to in-situ hybridization, polymerase chain reaction, Sanger Sequencing and Next generation sequencing.

Electron microscopy

- Demonstrate familiarity with the principles and techniques of electron microscopy and the working of the electron microscope.
- Demonstrate familiarity with the tissue processing and staining methods for electron microscopy, including immune-labelling techniques and use of semi-thin sections.

Enzyme histochemistry

- Demonstrate familiarity with the principles, use and interpretations of common enzyme histochemical procedures.

Quality Control

- Demonstrate familiarity with various quality control programmes running in the department, both internal and external quality.
- Demonstrate familiarity with inert and intra assay variations, batch variations, validation of chemicals and instruments.

Laboratory Safety and Good clinical lab practices

- Demonstrate familiarity with good lab practices and safety, record maintenance of capital equipment and consumables, purchase specifications, approximate costs of reagents and equipment, maintenance of store logbooks, etc.

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Biomedical Waste Management

- Demonstrate familiarity with disposal methods for each specimen, reagents, instruments, autoclaving techniques, recycling of products and e-waste.

At the end of the course, **the student should have acquired the following competencies as a <u>teacher:</u>**

- Demonstrate familiarity with different modes, methods, and principles of teaching including microteaching.

At the end of the course, **the student should have acquired the following competencies as a <u>researcher:</u>**

- Conversant with the principles of basic and applied research methodology, literature search, study design, sample size estimation, selection of controls, and appropriate application of medical statistics.
- Possess knowledge about the methods of writing thesis and/or a research paper with the prescribed instructions, as expected of international standards.
- Conversant with the use of digital slide imaging, algorithms to evaluate findings in imaging, morphometry, and application of artificial intelligence.

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B. AFFECTIVE DOMAIN

1. The student will show integrity, accountability, respect, compassion and dedicated patient care. The student will demonstrate a commitment to excellence and continuous professional development.
2. The student should demonstrate a commitment to ethical principles relating to providing patient care, confidentiality of patient information and informed consent.
3. The student should show sensitivity and responsiveness to patients' culture, age, gender and disabilities.
4. The student should demonstrate a commitment to ethical principles relating to research conduct and research publication.

C. PSYCHOMOTOR DOMAIN

1. Able to perform grossing of biopsy and surgical specimens including gross diagnosis and taking appropriate sections/ samples necessary for diagnosis, comprehensive staging, and ancillary testing.
2. Conversant in histopathology tissue processing techniques and troubleshooting, cutting of paraffin and frozen sections, making imprint smears, and staining, and immunohistochemistry.
3. Able to collect specimens by routinely performing non-invasive out-patient procedures such as venipuncture, finger-prick, fine needle aspiration of superficial lumps and bone-marrow aspirates, making smears and staining, and provide appropriate guidance to colleagues performing procedure such as a biopsy or an imaging guided biopsy including on-site microscopic assessment of specimen adequacy.
4. Perform an autopsy, dissect various organ complexes and display the gross findings.
5. Conversant with the function, handling, and routine care of equipment in the laboratory and quality assurance.
6. Able to teach and share his knowledge and competence with others. The student should be imparted training in teaching methods in the subject which may enable the student to take up teaching assignments in Medical Colleges/Institutes.
7. Able to pursue clinical and laboratory-based research. He/she should be introduced to basic research methodology so that he/she can independently conduct fundamental and applied research.

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Syllabus

Course contents:

It is difficult to give a precise outline of the Course Contents for post graduate training. A postgraduate is supposed to acquire not only the professional competence of a well-trained specialist but also academic maturity, a capacity to reason and critically analyze scientific data as well as to keep himself abreast of the latest developments in the field of Pathology and related sciences. The study of Anatomic Pathology includes all aspects of Pathology as encompassed in the branches of General and Systemic Pathology. Only the broad outlines are provided.

A. COGNITIVE DOMAIN

A) General Pathology:

Normal cell and tissue structure and function:

- The changes in cellular structure and function in diseases.
- Causes of disease, its pathogenesis, reaction of cells, tissues, organ systems, and the body to various sub lethal and lethal injuries.
- Cellular adaptation, cell injury, and cell death.
- Mechanism, morphology and examples of cell injury, necrosis, apoptosis, autophagy, and newer forms of cell death including necroptosis and pyroptosis.
- Sub cellular and cellular responses and adaptation to injury.
- Intracellular and intercellular accumulations, pathological calcification, and cell aging.

Acute and chronic inflammation:

- Vascular and cellular events in acute inflammation, chemical mediators, outcome, and morphological patterns of acute inflammation.
- Chronic inflammation with special reference to granulomatous inflammation.
- Systemic effects and effects of deranged inflammation.
- Tissue renewal and repair: Regeneration healing and fibrosis.
- Control of normal cell proliferation and tissue growth, mechanism of tissue regeneration, repair by healing and fibrosis.
- Extracellular matrix and cell matrix interactions.

Hemodynamic disorders, thromboembolic disease, and shock:

- Edema, hyperemia, congestion, and hemorrhage.
- Normal Hemostasis, thrombosis, DIC, embolism, infarction, and shock.

Genetic Disorders

- Principles of genetics, normal karyotyping.
- Mutations, Mendelian disorders, disorders with multifactorial inheritance cytogenetic disorders involving autosomes and sex chromosomes.
- Single gene disorders with nonclassic inheritance.
- Diagnosis of genetic disorders involving molecular and genetic techniques.

Neoplasia

- Definition, nomenclature, and biology of tumor growth
- Molecular basis of cancer with special reference to carcinogenic agents and molecular basis of multistep carcinogenesis.
- Epidemiology and clinical features of tumors.

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- Grading, staging and laboratory diagnosis of cancer.

Infectious Diseases

- Pathology and general principles of microbial pathogenesis, special techniques for diagnosing bacterial, fungal, parasitic, and viral infections.

Environmental and nutritional pathology

- Common environmental and occupational exposures leading on to diseases.
- Nutritional deficiencies and obesity related disorders.

Disease of Infancy and Childhood

- Congenital anomalies, birth injuries, diseases of neonates, inborn errors of metabolism, tumor, and tumor like lesions of infancy and childhood.

Immunopathology

- Innate immunity- Role of phagocytic cells, complement, mast cells & humoral mechanisms.
- Specific Acquired Immunity- Details about antibody production & action, Brief principles about memory, Ag specificity & vaccination.
- Cell involved in Immune response- T- Lymphocytes, B-lymphocytes, macrophages, dendritic cells, and natural-killer cells.
- Cytokines with details about their properties and functions.
- Structure and function of histocompatibility molecules and disease association.
- Disorders of the immune system.
- All hypersensitivity reactions.
- Autoimmune disorders with special reference to SLE, Rheumatoid arthritis, Sjogren's syndrome, systemic sclerosis, polyarteritis nodosa and other vasculitides, Mixed connective tissue disorders and inflammatory disorders.
- Immunodeficiency syndrome – Acquired with emphasis on AIDS.
- Amyloidosis including pathogenesis, special stains & clinical correlation.
- Transplant rejection in detail.
- Graft vs Host Disease.

B) Systemic Pathology:

The study of normal structure and function of various organ systems and the etiopathogenesis, gross and microscopic alterations of structure of these organ systems in disease and functional correlation with clinical features.

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Blood vessels, lymphatic and veins

- Normal morphology, congenital anomalies, atherosclerosis, hypertensive vascular disease.
- Inflammatory and neoplastic diseases of all the vessels.

Heart

- Normal morphology, its blood supply and effect of aging on heart.
- Ischemic, Hypertensive, valvular, congenital heart diseases.
- Cardiomyopathies
- Myocardial disorders
- Pericardial diseases.
- Tumors of the heart.

Lungs and Mediastinum

- Congenital anomalies
- Obstructive and restrictive pulmonary diseases
- Diseases of vascular origin
- Infections of Lung
- Infections of Mediastinum
- Tumors of lung
- Lung transplantation
- Diseases of pleura
- Thymus – Developmental, autoimmune, and inflammatory disorder and tumors.

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Head and Neck

- Oral cavity: - inflammatory disease, Preneoplastic lesions and tumors.
- Diseases of teeth and supporting structures.
- Upper airways and ear – congenital anomalies, infections, and tumors.
- Salivary glands – Infections autoimmune disorders and tumors.

Gastrointestinal Tract

- Congenital anomalies, infections, inflammatory and vascular disorders and tumors of esophagus, stomach, small and large intestines, appendix, and anal canal.
- Diseases of the peritoneum, Omentum and Mesentery Retroperitoneum.
- Inflammatory and neoplastic lesions.

Liver

- Normal morphology with general features of hepatic disease including LFTs.
- Infectious, autoimmune drug induced metabolic and circulatory disorders of liver.

- Hepatic diseases associated with pregnancy, neonates, organ and bone marrow transplantation.
- Liver transplantation pathology.
- Cysts, Nodules, and tumors of liver.

Biliary tract

- Congenital anomalies, injuries, Infection, inflammation, of Gallstones and tumors of gall bladder and extra hepatic bile ducts. Pancreas.
- Congenital anomalies, pancreatitis, and neoplasms of pancreas.

Kidney

- Clinical manifestations of renal diseases
- Congenital anomalies
- Diseases affecting glomeruli, tubules, interstitium and blood vessels.
- Cystic diseases of kidney
- Nephrolithiasis
- Tumors of kidney
- Kidney Transplant pathology

Lower urinary tract and male genital system

- Congenital anomalies, inflammation and tumors of bladder, ureter, urethra, penis, testis, epididymis, and Scrotum.
- Inflammation, enlargement, and tumors of prostate.

Female genital tract

- Physiology, cytology and histology of female genital tract, menstrual disorders, and hormonal abnormalities.
- Congenital anomalies, inflammation, preneoplastic and neoplastic lesions of vulva, vagina, cervix, uterus, fallopian tubes, ovaries and mesonephron.
- Gestational and placental disorders.

Breast

- Inflammations, benign epithelial lesions, and tumors of the breast.
- Diseases of male breast.

Endocrine System

- Normal hormonal levels and functions of all the endocrine glands.
- Hypo and hyperactivity of glands of endocrine system i.e., pituitary, thyroid, parathyroid, pancreas, adrenals, and pineal gland.

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- Autoimmune diseases, inflammations and tumors affecting these glands,
- Neuroendocrine tumors,

Skin and Subcutaneous tissue

- Disorders of pigmentation and melanocytes,
- Inflammatory, vesiculobullous, and infectious disease,
- Proliferative lesions and Tumors of the epidermis, dermis, and skin appendage.

Musculoskeletal system

- Bone Modelling, growth, and development, genetic and acquired abnormalities in bone cells, matrix and structure, factures, necrosis and infections of bones, tumors and tumor-like lesions,
- Joints: Arthritis, tumor, and tumor-like lesions.
- Soft tissue: Tumors and tumor=like lesions.

Peripheral nerves and skeletal muscles

- General reactions of motor units.
- Inflammatory, infectious, hereditary, metabolic, and traumatic neuropathies.
- Atrophy, dystrophy, myopathies of the skeletal muscles.
- Diseases of neuromuscular junction.
- Tumors of peripheral nerves and skeletal muscles.

Skull and Central Nervous System

- Degenerative, metabolic, toxic, demyelinating, infectious, cerebrovascular malformations, and traumatic injuries.
- Tumors.

Eye and Orbit

- Infections, inflammatory, congenital diseases and neoplasms of orbit, eyelid, conjunctiva sclera, uvea, cornea, retina, and optic nerves.

C) Hematology and Transfusion medicine

The study of Hematology includes all aspects of the diseases of the blood and bone marrow. This would involve the study of the normal, and the causes of diseases and the changes thereof.

Biology of stem cell and Hematopoiesis

- Overview of stem cell biology and cellular biology of hematopoiesis.
- Transcription factors and humoral regulation in normal and malignant hematopoiesis.
- Interaction between hematopoietic stem cells, progenitor cell and stromal compartment of bone marrow.

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- Stem cell homing & mobilization.

Erythroid maturation, differentiation, and abnormality

- Pathobiology of human erythrocyte & Hemoglobin Anemia.
- Approach to anemia in adults and children in: Clinical correlation & diagnostic modalities.
- Classification of anemias (Morphological, pathophysiological, and based on erythropoiesis i.e., proliferative vs non-proliferative).
- Iron deficiency anemia including iron metabolism and differential diagnosis from other microcytic hypochromic anemias.
- Disorder of iron metabolism including iron overload.
- Anemia of chronic disorders with special reference to infections, collagen vascular disorders, inflammation etc.
- Megaloblastic anemia and other causes of megaloblastosis.
- Definition, approach, and classification of hemolytic anemia.
- Lab diagnosis of Hemoglobin disorders and hereditary anemia like Thalassemia and related hemoglobinopathies, sickle cell anemia.
- Hemoglobin associated with altered Oxygen affinity.
- Red blood cell enzymopathy, membrane disorder, autoimmune hemolytic anemia, non-immune hemolytic anemia, paroxysmal nocturnal hemoglobinuria.
- Approach to Pancytopenia/ Cytopenia.
- Bone marrow failure syndrome.
- Porphyria.

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WBC disorders, complement and immunoglobin biology

- Normal granulopoiesis.
- Acquired and congenital disorders of phagocytosis (neutrophil, monocyte, eosinophil, and macrophages.
- Disorder of leukocyte number, function, and morphology.

Storage disorder

Hematological responses to Infections

- Viral disorders - Infectious mononucleosis, Hepatitis, and dengue.
- Parasitic infections - Malaria, Kala azar.

Hematological malignancies

- Conventional & molecular cytogenetic and immunohistochemical basis of hematological malignancies.

- Classification (WHO, ICC).
- Their basis and diagnostic approach to various hematological malignancies.
- Pathophysiology, prognostic factors, cytochemistry, cytogenetics of various leukemias.
- Pathophysiology and classification of MDS, MPN/MDS, myeloproliferative disorders.
- Pathophysiology of Non-Hodgkin's lymphoma, Clinical staging of Hodgkin's lymphoma.
- Role of molecular cytogenetics and immunohistochemistry in Hodgkin's and Non-Hodgkin's lymphoma and lymphoproliferative disorders.
- AIDS related and Transplant related lymphomas.
- Plasma cell dyscrasias and gammopathies.
- Mastocytosis.
- Role of chemotherapy and antineoplastic agents based on molecular mechanism of hematological malignancies, clinical use of hematopoietic growth factors.

Hematopoietic stem cell transplantation

- Role and indications of HST, immunodeficiency state, hematological Malignancies and Non-hematological disorders.
- Practical aspect of umbilical cord stem cells transplantation.
- Peripheral stem cell collection.
- Role of stem cell in tissue repair.
- Complications of Hematopoietic stem cell transplant.
- Gene therapy and genetic engineering.

Prenatal diagnosis of genetic hematological diseases

Hemostasis & Thrombosis

- Megakaryocyte and platelet structure.
- Molecular basis of platelet function, activation.
- Role of blood vessel, coagulation system and fibrinolytic system in hemostasis.
- Clinical and lab evaluation of bleeding and coagulation disorders.
- Clinical & diagnostic aspects of factor deficiencies including hemophilia, von Willebrand disease, DIC, Vitamin K deficiency.
- Thrombotic and non-thrombotic purpura.
- Hereditary and acquired platelet disorders and its management.
- Thrombophilia (Inherited & acquired).
- Lab evaluation and management of hypercoagulable states.

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Human blood group antigen and antibody and Immuno-hematology

- Selection of donor and screening..
- Principle, indication and storage of red blood cells, WBC, platelet, and plasma transfusion.
- Various methods of component separation and plasma derivatives with special reference to Fresh frozen plasma, cryo-precipitates, platelet concentrate, single donor plasma, albumin, and Immunoglobulin.
- Graft Rejection, GVH diseases, Transfusion Reactions, Blood grouping & cross matching.
- Blood bank audit.
- Apheresis

Hematological manifestations of systemic diseases

- Liver disorders, renal disorders, infections, cancers, parasitic diseases, AIDS, pregnancy, and surgical patients.

Spleen and its disorders

D) Laboratory Medicine (Clinical Pathology including Parasitology)

- Principles of testing, indications, values with ranges in normal and diseased states in relation to:
    - Liver function tests
    - Renal function tests
    - Endocrine function tests
    - Body fluid analysis including stool, urine, semen, CSF, etc.
- Principles of laboratory automation, trouble shooting, and quality assurance.

D) Special techniques

The student is expected to acquire a general acquaintance of techniques and principles and to interpret data in the following fields:

- Immunopathology,
- Electron microscopy,
- Histochemistry,
- Immunohistochemistry,
- Cytogenetics and in-situ hybridization,
- Molecular Biology,
- Digital Pathology and image analysis,

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- Maintenance of records,
- Information retrieval, use of Computer and Internet in medicine.

E) Instrumentation and automation

- Principles, indications, working, maintenance, and troubleshooting of equipment used in various laboratories:
    - Histopathology laboratory – Histopathology tissue processor, microtome, water batch, embedding station, Stainer, IHC Stainer, ultramicrotome, etc.
    - Microscopes – Immunofluorescence, FISH, Confocal, Electron, etc.
    - Cytopathology Laboratory – Centrifuge, Cytocentrifuge, Cytospin apparatus, liquid-based cytology, etc.
    - Hematology Laboratory – automated cell counter, flow cytometer, coagulometer, HPLC, Electrophoresis apparatus, immunoblot, etc.
    - Clinical Pathology –Photoelectric colorimeter, Spectrophotometer, pH meter, Centrifuge, Electrophoresis apparatus, ELISA Reader, chemiluminescence, etc.
    - Digital pathology – Whole slide scanners
    - Molecular pathology – PCR, Sanger sequencer, NGS sequencers, etc.
- Automation in Pathology.
- Good lab practices and safety, record maintenance of capital equipment and consumables, purchase specifications, approximate costs of reagents and equipment, maintenance of store logbooks, etc.

F) Quality assurance program

- Internal and external quality assurance methods.
- Intra assay variations, batch variations, validation of chemicals and instruments.

G) Establishment Act and Rules and regulations formed by Govt. or regulatory bodies

H) Biomedical Waste management

- Disposal methods for each specimen, reagents, instruments, autoclaving techniques, recycling of products and e-waste.

I) Biostatistics, Research Methodology and Clinical Epidemiology

J) Ethics and Medico legal aspects relevant to Pathology

K) Current topics and recent advances in pathology

B. PSYCHOMOTOR DOMAIN

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Demonstrate following predominant Psychomotor domain competencies		
Sr. No.	Competency	Perform under supervision/ perform independently/ Observation only
I.	HISTOPATHOLOGY (SURGICAL PATHOLOGY)	
1.	Given the clinical and operative data, identify and systematically and accurately describe the chief gross anatomic alterations in the surgically removed specimens and be able to correctly diagnose common lesions received on an average day from the surgical service of an average teaching hospital	Independently
2.	Perform a systematic gross examination of the tissues including the taking of appropriate tissue sections and in special cases as in intestinal mucosal biopsies, muscle biopsies and nerve biopsies, demonstrate the orientation of tissues in paraffin blocks.	Independently
3.	Identify and systematically and accurately describe the chief histo-morphological alterations in the tissue received in the surgical pathology service. He/she should also correctly interpret and correlate with the clinical data to diagnose routine surgical material received on an average day.	Independently
4.	Identify common problems in histopathology processing techniques (poor fixation, delayed fixation, poor staining, etc.,) including automated tissue processing machine troubleshooting and rectify common problems	Independently
5.	Operate and maintain common equipment in the histopathology laboratory such as microtome, water bath, cryostat, tissue processor, auto Stainer, etc.	Perform under supervision
6.	Process a tissue, make a paraffin block and cut sections of good quality on a rotary microtome	Perform under supervision
7.	Stain paraffin sections with hematoxylin and eosin stain and common special stains needed for diagnosis	Independently
8.	Cut a frozen section, stain and interpret the slide in correlation with the clinical data provided	Independently

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9.	Standardize and validate new antibodies for immunohistochemistry with understanding of controls, clones, and dilutions	Independently
10.	Perform immunohistochemistry on paraffin sections using manual method	Independently
11.	Identify common problems in immunohistochemistry procedure (artifacts, inadequate retrieval, section floating, IHC failure, etc.,) and rectify such problems	Independently
12.	Decide on the appropriate immunohistochemical panels for diagnosis, prognosis and predictive purposes in common disease conditions based on standard recommendations and interpret their results	Independently
13.	Write histopathology reports, including synoptic reports, wherever needed, following protocols and international standards. The reports should be succinct and lucid, with clinical notes and advice, as necessary.	Independently
II	CYTOPATHOLOGY	
1.	Perform fine needle aspiration of superficial lumps and make good quality smears including collection of material for cell block preparation and decide on the type of fixative and stain in a given case	Independently
2.	Prepare and stain good quality smears for cytopathological examination	Independently
3.	Provide appropriate guidance to colleagues performing procedure such as a biopsy or an imaging guided biopsy including on-site microscopic assessment of specimen adequacy.	Independently
4.	Decide on the technique of collection, preservation, transport and concentration of various exfoliative cytology specimens (such as filters, centrifuge, liquid-based cytology, cytospin, etc.)	Independently
5.	Perform on-site adequacy assessment in image guided sampling procedures and decide on sample triage for routine diagnosis (type of preparation, stain, etc.) and ancillary tests including microbiological and molecular tests	Independently
6.	Diagnose common cases received in a routine cytopathology laboratory and categorize them into negative, inconclusive and positive, using the correct technique of screening and dotting the slides	Independently

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	for suspicious cells, correctly identify the type of tumor, if present, and the presence of organisms, fungi and parasites, if present	
7.	Perform preparations (cytospin smears, liquid-based cytology, cell blocks, etc.) of common cytological samples using equipment such as centrifuge, cytocentrifuge and liquid based cytology apparatus	Observation only
III	HEMATOLOGY	
1.	Perform venipuncture for peripheral blood collection and decide on appropriate collection tubes, storage, and anticoagulant based on indication	Independently
2.	Prepare good quality peripheral blood smears, stain and report peripheral blood counts and other findings including reticulocyte and platelet counts on cell counter and manually	Independently
3.	Perform bone marrow aspirates and biopsy, prepare good quality smears and imprints	Perform under supervision
4.	Perform bone marrow aspirate staining including stain for iron	Independently
5.	Perform cytochemical characterization of leukemia with special stains on bone marrow aspirates	Perform under supervision
6.	Perform and interpret coagulation profile including PT, APTT and FDP	Independently
7.	Perform and interpret sickling test and osmotic fragility test	Independently
8.	Describe accurately the morphologic findings in the peripheral and bone marrow smears, identifying and quantitating the morphologic abnormalities in disease states and arriving at a correct diagnosis in at least common cases referred to the Hematology clinic, given the relevant clinical data	Independently
9.	Given the clinical data, interpret the results of i. Red cell indices ii. Plasma hemoglobin iii. Hemosiderin in urine iv. Hemolytic anemia profile including HPLC, Hb electrophoresis etc. v. Hemoglobin and serum protein electrophoresis vi. Clotting time and other point of care tests for bleeding	Independently

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	vii. G6PD enzyme estimation viii. Platelet function tests including platelet aggregation and adhesion and PF3 release ix. Russell's viper venom time (RVVT) x. Coagulation Factor assays xi. Serum Fibrinogen xii. Screening for coagulation factor inhibitor, Bethesda Assay, xiii. Fibrin Degradation Products (FDP), D-Dimers xiv. Monitoring of anti-coagulant therapy xv. Thrombophilia profile (Lupus anticoagulant (LAC), Anticardiolipin Antibody (ACA), Activated Protein C Resistance (APCR), Protein C (Pr C), Protein S (Pr S) and Antithrombin III (AT III)) xvi. Serum ferritin, Serum iron and total iron binding capacity	
10.	Interpret flow cytometry findings in the immunophenotyping of leukemia, CD34 enumeration, CD 3/CD 19 enumeration, PNH work up, etc.	Independently
11.	Interpret results of cytogenetics and molecular diagnostics in the work up of hematological diseases	Independently
12.	Prepare samples as appropriate for the indication, and operate equipment such as automated cell counter, flow cytometry, coagulometers, HPLC and electrophoresis apparatus	Observation only
IV	LABORATORY MEDICINE	
1.	Plan a strategy of laboratory investigation of a given case, given the relevant clinical history and physical findings in a logical sequence, with a rational explanation of each step; be able to correctly interpret the laboratory data of such studies, and discuss their significance with a view to arrive at a diagnosis.	Independently
2.	Perform urine analysis including physical, chemical and microscopic, examination of the sediment as well as by Dipstick methods.	Independently
3.	Perform macroscopic and microscopic examination of feces and identify the ova and cysts of common parasites.	Independently

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4.	Perform a complete examination: physical, chemical and cell content of Cerebrospinal Fluid (C.S.F), pleural and peritoneal fluid	Independently
5.	Perform semen analysis and interpret results in the context of clinical and hormone findings	Independently
6.	Perform quantitative estimation of blood/serum by automated techniques for common biochemical tests	Independently
7.	Prepare standard solutions and reagents relevant to common biochemical tests including the preparation of normal solution, molar solution and buffers	Independently
8.	Interpret and report common laboratory biochemical tests (LFT, KFT, endocrine function tests) with understanding of clinical implications	Independently
9.	Operate, maintain and troubleshoot common equipment used such as photoelectric colorimeter, Spectrophotometer, pH meter, Centrifuge, Electrophoresis apparatus, ELISA Reader, PCR, chemiluminescence, etc.	Perform under supervision
V	TRANSFUSION MEDICINE	
1.	Perform selection and bleeding of donors, ABO and Rh grouping and cross match, antibody screening and titer, selection of blood for exchange transfusion	Independently
2.	Resolve ABO grouping problems and outline measures for investigation of transfusion medicine	Independently
3.	Perform and interpret anti-globulin test in antenatal and neonatal work up	Independently
4.	Prepare blood components such as cryoprecipitates, platelet concentrates, fresh frozen plasma, single donor plasma, red blood cell concentrates, etc. and test blood for presence of pathogens including HBV, HCV, HIV, VDRL, Malaria, etc.	Observation only
VI	AUTOPSY	
1.	Perform an autopsy, dissect various organ complexes, and display the gross findings (Note: An improvised autopsy may also be arranged in places where full autopsy is not possible. Relevant organs from wet specimens in the museum with appropriate clinical history may be arranged for a detailed description and diagnosis. At least ten such	Independently (see Note)

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	improvised autopsies may be discussed by each candidate during the entire duration of the course)	
2.	Provide Provisional and Final Anatomic Diagnosis report, major findings correctly and systematically at autopsy, and the Autopsy Protocol as per prescribed instructions.	Independently
VII	MOLECULAR BIOLOGY	
1.	Interpret results of Polymerase Chain Reaction (PCR), real time PCR, Sanger Sequencing in a given clinical context.	Independently
2.	Interpret results of in-situ hybridization (fluorescent and chromogenic) in a given clinical context	Independently
3.	Prepare sample by appropriate methods and perform Polymerase Chain Reaction (PCR), real time PCR, Sanger Sequencing, and in-situ hybridization including troubleshooting	Observation only
VIII	IMMUNOPATHOLOGY	
1.	Interpret direct/ indirect immunofluorescence results in the context of common diseases of the skin, medical renal diseases and autoimmune diseases	Independently
2.	Prepare sample by appropriate methods and perform indirect immunofluorescence on a frozen section from skin/ renal biopsy	Perform under supervision
IX	ELECTRON MICROSCOPY	
1.	Interpret transmission electron microscopy results in common non-neoplastic and neoplastic diseases	Independently
2.	Prepare specimen by appropriate methods and process tissue for electron microscopy, interpret semi-thin sections and view ultra-thin sections under electron microscope	Observation only
X.	DIGITAL PATHOLOGY	
1.	Navigate and annotate whole slide scanned images	Independently
2.	Select and scan slides for digitalization and perform basic image analysis functions such as length measurements, enumeration, etc.	Observation only
XI.	TEACHING	
1.	Demonstrate different methods of teaching-learning and assessments	Independently
2.	Engage and teach undergraduates and paramedical staff in the form of small group teaching and demonstrations	Independently

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3.	Engage in peer teaching in the form of presenting seminars and journal clubs and be able to use different modes of teaching including PowerPoint projections and charts	Independently
XII.	RESEARCH	
1.	Write the thesis (and/or a scientific paper) in accordance with the prescribed instructions, as expected of international standards	Independently

TEACHING AND LEARNING METHODS

General principles

Acquisition of competencies being the keystone of doctoral medical education, such training should be skills oriented. Learning in the program, essentially autonomous and self-directed, and emanating from academic and clinical work, shall also include assisted learning. The formal sessions are meant to supplement this core effort.

All students joining the postgraduate (PG) courses shall work as full-time (junior) residents/demonstrators during the period of training, attending not less than 80% of the training activity during the calendar year, and participating in all assignments and facets of the educational process. They shall maintain a logbook for recording the training they have undergone, and details of the procedures done during laboratory and clinical postings in real time. Maintenance of e-records of such procedures is encouraged.

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The three-year training programme for the MD degree may be arranged in the form of postings to different assignments/laboratories for specified periods as outlined below. The period of such assignments/postings is recommended for 36 months with breaks only for examinations and mandatory postings. Posting schedules may be modified depending on needs, feasibility and exigencies. For facilities not available in the parent institution as well as for additional knowledge and skill, extramural postings may be undertaken. Departments may vary the postings slightly based on the clinical profile of the hospital, within the time period bands given below, however at least the lower limit for each of the four main components of the course must be covered during postings.

Posting schedule is given below:

S. No	Section/ Subject	Duration in months
(i)	Surgical Pathology, Autopsy, Immunohistochemistry	11-16
(ii)	Hematology, Laboratory Medicine, and Blood bank	8-10
(iii)	Cytopathology	6-9
(iv)	Basic Sciences, Immunopathology, Cytogenetics, Electron microscopy, Molecular Biology etc. and Research Techniques including Thesis	2-6
	Total	**36 (including exam)**

Teaching-Learning methods

This should include a judicious mix of demonstrations, symposia, journal clubs, clinical meetings, seminars, small group discussion, case-based learning, simulation-based teaching, self-directed learning, integrated learning, interdepartmental meetings, and any other collaborative activity with the allied departments. Methods with exposure to the applied aspects of the subject relevant to basic/clinical sciences should also be used. **The suggested examples of teaching-learning methods are given below but are not limited to these. The frequency of various below mentioned teaching-learning methods can vary based on the subject's requirements, competencies, workload and overall working schedule in the concerned subject. The Pathology resident is expected to sit in reporting every day, having seen the slides the previous day with written descriptions, which should be evaluated daily by the reporting faculty. This is the mainstay of training in all disciplines of Pathology.**

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A. Lectures: Didactic lectures should be used sparingly. A minimum of 10 lectures per year in the concerned PG department is suggested. Topics to be selected as per subject requirements All postgraduate trainees will be required to attend these lectures. Lectures can cover topics such as:

1. Subject related important topics as per specialty requirement
2. Recent advances
3. Research methodology and biostatistics
4. Salient features of Undergraduate/Postgraduate medical curriculum
5. Teaching and assessment methodology.

Topic numbers 3, 4, 5 can be done during research methodology/biostatistics and medical education workshops in the institute.

B. Journal club: Minimum of once in 1-2 weeks is suggested.

Topics will include presentation and critical appraisal of original research papers published in peer reviewed indexed journals. The presenter(s) shall be assessed by faculty and grades recorded in the logbook.

C. Student Seminar: Minimum of once every 1-2 weeks is suggested.

Important topics should be selected as per subject requirements and allotted for in-depth study by a postgraduate student. A teacher should be allocated for each seminar as faculty moderator to help the student prepare the topic well. It should aim at comprehensive evidence-based review of the topic. The student should be graded by the faculty and peers.

D. Student Symposium: Minimum of once every 3 months.

A broad topic of significance should be selected, and each part shall be dealt by one postgraduate student. A teacher moderator should be allocated for each symposium and moderator should track the growth of students. The symposium should aim at an evidence-based exhaustive review of the topic. All participating postgraduates should be graded by the faculty and peers.

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E. Laboratory work/ Interactive slide and gross sessions: Minimum - once every 1-2 weeks.

Laboratory work, slide and gross specimen teaching sessions should be coordinated and guided by faculty from the department. Various methods like case-based discussions, oral or written quiz, etc. are to be used. Faculty from the department should participate in moderating the teaching-learning sessions.

F. Interdepartmental colloquium

Faculty and students must attend monthly meetings between the main Department and other department/s on topics of current/common interest or clinical cases. This includes institutional activities such as clinical combined rounds (CCR), clinic-pathological correlation conferences (CPC), and departmental activities like autopsy conferences.

G. a. Rotational clinical / community / institutional postings

Depending on local institutional policy and the subject specialty needs, postgraduate trainees may be posted in relevant departments/ units/ institutions. The aim would be to acquire more in-depth knowledge as applicable to the concerned specialty. Postings would be rotated

between various units/departments and details to be included in the specialty-based Guidelines. Few examples are listed below:

- Laboratory-based specialty units/departments e.g. Biochemistry / Microbiology/ Infection control unit/Laboratory Medicine, Hematology, Blood bank, Transplantation Immunology, Forensic Medicine, Proteomics, etc.
- Medical Education Unit (MEU) or Department of Medical Education (DOME): optional

G. b. Posting under "District Residency Programme" (DRP):

All postgraduate students pursuing MS/MS in broad specialties in all Medical Colleges/Institutions shall undergo a compulsory rotation of three months in District Hospitals/District Health System as a part of the course curriculum, as per the Postgraduate Medical Education (Amendment) Regulations (2020). Such rotation shall take place in the 3rd or 4th, or 5th semester of the Postgraduate programme and the rotation shall be termed as "District Residency Programme" and the PG medical student undergoing training shall be termed as "District Resident".

Every posting should have its defined learning objectives. It is recommended that the departments draw up objectives and guidelines for every posting offered in conjunction with the collaborating department/s or unit/s. This will ensure that students acquire expected competencies and are not considered as an additional helping hand for the department / unit in which they are posted. The PG student must be tagged along with those of other relevant departments for bedside case discussion/basic science exercises as needed, under the guidance of an assigned faculty.

Opportunities to present and discuss infectious disease cases through bedside discussion and ward/grand rounds with specialists / clinicians in different hospital settings must be scheduled to address antimicrobial resistance issues and strategies to deal with it.

H. Teaching research skills

Writing a thesis should be used for inculcating research knowledge and skills. All postgraduate students shall conduct a research project of sufficient depth to be presented to the University as a postgraduate thesis under the supervision of an eligible faculty member

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of the department as guide and one or more co-guides who may be from the same or other departments.

In addition to the thesis project, every postgraduate trainee shall participate in at least one additional research project that may be started or already ongoing in the department. It is preferable that this project will be in an area different from the thesis work. For instance, if a clinical research project is taken up as thesis work, the additional project may deal with community/field/laboratory work. Diversity of knowledge and skills can thereby be reinforced.

I. Training in teaching skills

MEU/DOME should train PG students in education methodologies and assessment techniques. The PG students shall conduct UG classes in various courses and a faculty shall observe and provide feedback on the teaching skills of the student.

J. Logbook

During the training period, the postgraduate student should maintain a Logbook indicating the duration of the postings/work done in Wards, OPDs, Casualty and other areas of posting. This should indicate the procedures assisted and performed and the teaching sessions attended. The logbook entries must be done in real time. The logbook is thus a record of various activities by the student like: (1) Overall participation & performance, (2) attendance, (3) participation in sessions, (4) record of completion of pre-determined activities, and (5) acquisition of selected competencies.

The purpose of the Logbook is to:

a) help maintain a record of the work done during training,
b) enable Faculty/Consultants to have direct information about the work done and intervene, if necessary,
c) provide feedback and assess the progress of learning with experience gained periodically.

The Logbook should be used in the internal assessment of the student, should be checked and assessed periodically by the faculty members imparting the training. The PG students will be required to produce completed logbook in original at the time of final practical examination. It should be signed by the Head of the Department. A proficiency certificate from the Head

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of Department regarding the clinical competence and skillful performance of procedures by the student will be submitted by the PG student at the time of the examination.

The PG students shall be trained to reflect and record their reflections in logbook particularly of the critical incidents. Components of good teaching practices must be assessed in all academic activity conducted by the PG student and at least two sessions dedicated for assessment of teaching skills must be conducted every year of the PG program. The teaching faculty are referred to the MCI Logbook Guidelines uploaded on the Website.

K. Course in Research Methodology

All postgraduate students shall complete an online course in Research Methodology within six months of the commencement of the batch and generate the online certificate on successful completion of the course.

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Other aspects

- The Postgraduate trainees must participate in the teaching and training program of undergraduate students and interns attending the department.
- Trainees shall attend accredited scientific meetings (CME, symposia, and conferences) at least once a year.
- Department shall encourage e-learning activities.
- The Postgraduate trainees should undergo training in Basic Cardiac Life Support (BCLS) and Advanced Cardiac Life Support (ACLS).
- The Postgraduate trainees must undergo training in information technology and use of computers.

During the training program, patient safety is of paramount importance; therefore, relevant clinical skills are to be learnt initially on the models, later to be performed under supervision followed by independent performance. For this purpose, provision of skills laboratories in medical colleges is mandatory.

ASSESSMENT

FORMATIVE ASSESSMENT, i.e., assessment to improve learning

Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self-directed learning and ability to practice in the system.

General Principles

Internal Assessment should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills. The Internal Assessment should be conducted in theory and practical/clinical examination, should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills.

Quarterly assessment during the MD training should be based on:

- Case presentation, case work up, case handling/management : once a week
- Laboratory performance : twice a week
- Journal club : once a week
- Seminar : once a fortnight
- Case discussions : once a fortnight/month
- Interdepartmental case or seminar : once a month

Note: These sessions may be organized and recorded as an institutional activity for all postgraduates.

- Attendance at Scientific meetings, CME programmes (at least 02 each)

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The student to be assessed periodically as per categories listed in appropriate (non-clinical/clinical) postgraduate student appraisal form (Annexure I).

SUMMATIVE ASSESSMENT, i.e., assessment at the end of training

Essential pre-requisites for appearing for examination include:

1. **Logbook** of work done during the training period including rotation postings, departmental presentations, and internal assessment reports should be submitted.

2. At least **two presentations** at state/national level conference. One paper (thesis or non-thesis related work) should be published /accepted/publication draft in an indexed journal.

The summative examination would be carried out as per the Rules given in the latest POSTGRADUATE MEDICAL EDUCATION REGULATIONS. The theory examination shall be held in advance before the Clinical and Practical examination, so that the answer books can be assessed and evaluated before the commencement of the clinical/Practical and Oral examination**.**

The postgraduate examination shall be in three parts**:**

1. **Thesis**

   Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination. The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination. A post graduate student in broad specialty shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners**.**

2. **Theory examination**

   The examinations shall be organized based on 'Grading 'or 'Marking system' to evaluate and to certify post graduate student's level of knowledge, skill, and competence at the end of the training, as given in the latest POSTGRADUATE MEDICAL EDUCATION REGULATIONS. Obtaining a minimum of 50% marks in 'Theory' as well as 'Practical' separately shall be mandatory for passing examination. The examination for M.D./ M.S shall be held at the end of 3rd academic year.

   There shall be four theory papers (as per PG Regulations).

   Paper I: Basic sciences as applied to the subject (general pathology, pathophysiology, immunopathology, and molecular biology).

   Paper II: (Systemic pathology – surgical and cytopathology).

   Paper III: (Hematology, transfusion medicine and laboratory medicine including instrumentation and quality control).

   Paper IV: Recent advances in the subject.

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The papers should have ideally one (01) structured long answer question which will evaluate comprehensive in-depth knowledge and 6-8 short answer questions.

3. Practical/clinical and Oral/viva voce examination

Practical examination

Practical examination should be spread at least over **two** days for each student and include various major components of the syllabus focusing mainly on the psychomotor domain.

Oral/Viva voce examination on defined areas should be conducted by each examiner separately. Oral examination shall be comprehensive enough to test the post graduate student's overall knowledge of the subject focusing on psychomotor and affective domain.

The final clinical examination in broad specialty clinical subjects should include:

- Cases pertaining to major systems (e.g., one long case and three short cases),
- Stations for laboratory, procedural and communication skills,
- Logbook Records and reports of day-to-day observation during the training,
- It is emphasized that Oral/viva voce examination shall be comprehensive enough to test the post graduate student's overall knowledge of the subject.

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The practical examination in Pathology should follow general guidelines outlined below which may be modified according to local university guidelines and should be spread over at least two days. The following marks distribution is suggested:

Practical 500 marks (including 100 marks for internal assessment)

Section I: Histopathology: 150 marks

- Slides (12-15)
- Grossing/autopsy
- Long case (write a full description with clinical information provided) and/or 2 biopsy cases with ancillary tests reporting (written work only, no viva)

Section II: Cytopathology and histo/cyto techniques: 80 marks

- Slides (5-8)
- Histo/Cyto techniques
- Special stain exercise

- Immunopathology, OSPE, EM

Section III: Hematology, transfusion medicine and clinical pathology: 120 marks

- Slides
- Exercises
- Case study
- Blood bank
- Clinical pathology exercises and OSPE

Section IV: Viva, basic sciences, and communication skills: 50 marks

- Pedagogy/thesis presentation
- Oral viva
- Basic Sciences

Details of exercises in individual sections are given below:

I. Clinical Pathology:

- Discussion of a clinical case history.
- Plan relevant investigations of the above case and interpret the biochemistry findings.
- Two investigations should be performed including at least one clinical pathology exercise like CSF, pleural tap etc. analysis and complete urinalysis.

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II. Haematology:

- Discuss hematology cases given the relevant history. Plan relevant investigations.
- Perform complete hemogram and at least two tests preferably including one coagulation exercise.
- Identify electrophoresis strips, osmotic fragility charts etc., interpretation of data from auto analyzers, HPLC and flow cytometry.
- Examine, report, and discuss around ten cases given the history and relevant blood smears and/or bone marrow aspirate smears and bone marrow biopsy interpretation.

III. Transfusion Medicine:

- Perform blood grouping
- Perform the necessary exercise like cross matching.
- Coomb's test, gel cards interpretation.

IV. Histopathology and cytopathology:

- Examine, report, and discuss 12-15 cases histopathology and 5-8 cytopathology cases, given the relevant history and slides.
- Perform a Hematoxylin and Eosin stain and any special stain on a paraffin section. Should be conversant with histopathology techniques including cryostat.
- Long case (write a full description with clinical information provided) and/or 2 biopsy cases with ancillary tests reporting

V. Autopsy:

- Given a case history and relevant organs (with or without slides), give a list of anatomical diagnosis in an autopsy case.

VI. Gross Pathology

- Describe findings of gross specimens, give diagnosis, and identify the sections to be processed. The post graduate student should perform grossing in front of the examiners for evaluation.

VII. Basic Sciences:

- 10-15 spots based on basic sciences be included
- Identify electron micrographs
- Identify gels, results of PCR, immunological tests including interpretation of Immunofluorescence pictures, etc.
- Identify histochemical and immuno-histochemistry stains

VIII. Teaching exercise

- Teach on a small topic for about 10 min or present dissertation and research
- General Viva-Voce (Grand Viva) – structured viva may be done separately or combined with above exercises

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Recommended Reading:

Books (latest edition)

1. Histology for Pathologists. Stephen S. Sternberg (Ed), Raven Press, New York.
2. Robbin's Pathologic Basis of Disease Ramzi S.Cotran, Vinay Kumar, Stanley L Robbins WB Saunders Co., Philadelphia.
3. Ackerman's Surgical Pathology. Juan Rosai Mosby. St. Louis.
4. Diagnostic Surgical Pathology. Stephen S Sternberg. Lippincott, William Wilkins. Philadelphia.

5. Diagnostic Histopathology of Tumours. Christopher DM Fletcher (Ed). Churchill Livingstone. Edinburgh.
6. Manual & Atlas of Fine Needle Aspiration Cytology. Svante R Orell, et al London.
7. Theory and Practice of Histological Techniques, Bancroft JD, Stevens A, Turner DR, Churchill Livingstone, Edinburgh.
8. Diagnostic Cytology and its Histopathologic Basis, Koss LG, J.B. Lippincott, Philadelphia.
9. Comprehensive Cytopathology, Bibbo M, W.B. Saunders Co., Philadelphia.
10. Wintrobe's Clinical Hematology, Lee GR, Foerster J, Lupeus J, Paraskevas F, Gveer JP, Rodgers GN, Williams & Wilkins, Baltimore.
11. Atlas and Text of Hematology 4th edition. Singh T. Avichal Publishing Company.
12. Dacie and Lewis Practical Hematology, Bain BJ, Bates I, Laffan MA. Elsevier.
13. Bone Marrow Pathology, Bain BJ, Clark DM, Lampert IA, Blackwell Science, Oxford.
14. Henry's clinical diagnosis and management by laboratory methods.
15. WHO classification of tumors. IARC Lyon.

Journals

03-05 international Journals and 02 national (all indexed) journals.

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Annexure I

Student appraisal form for broad specialty non-clinical disciplines

	Elements	Less than Satisfactory			Satisfactory			More than satisfactory			Comments
		1	2	3	4	5	6	7	8	9	
1	**Scholastic aptitude and learning**										
1.1	Has knowledge appropriate for level of training										
1.2	Participation and contribution to learning activity (e.g., Journal Club, Seminars, CME etc)										
1.3	Conduct of research and other scholarly activity assigned (e.g Posters, publications etc)										
1.4	Documentation of acquisition of competence (eg Log book)										
1.5	Performance in work based assessments										
1.6	Self-directed Learning										
2	**Work related to training**										
2.1	Practical skills that are appropriate for the level of training										
2.2	Respect for processes and procedures in the work space										
2.3	Ability to work with other members of the team										
2.4	Participation and compliance with the quality improvement process at the work environment										

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2.5	Ability to record and document work accurately and appropriate for level of training										
3	**Professional attributes**										
3.1	Responsibility and accountability										
3.2	Contribution to growth of learning of the team										
3.3	Conduct that is ethically appropriate and respectful at all times										
4	**Space for additional comments**										
5	**Disposition**										
	Has this assessment pattern been discussed with the trainee?	Yes	No								
	If not explain.										
	Name and Signature of the assesse										
	Name and Signature of the assessor										
	Date										

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Subject Expert Group members for preparation of REVISED Guidelines for competency based postgraduate training programme for MD in Pathology

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NATIONAL MEDICAL COMMISSION
Postgraduate Medical Education Board

D 11011/1/22/AC/Guidelines/14 **Date: 05-08-2022**

GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR MD IN PAEDIATRICS

GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR MD IN PAEDIATRICS

PREAMBLE

The purpose of any postgraduate (PG) education is to train an individual, in this case a qualified MBBS doctor, to achieve competencies across all domains that enables the student to perform the professional role as an expert and specialist practicing a specialty in the community (Newborn to adolescent care; ambulatory and in-patient care; Well child/Healthy and Ill child; health promotion, disease prevention and curative care; individual and family centered care; emergency care, Intensive and routine Care). The shift towards competency-based medical education by Medical Council of India and continued by the National Medical Commission (NMC) focuses education to be outcome based, emphasizing abilities, balancing domains of learning and promoting a learner centered ownership of the curriculum.

The practice of medicine has and will continue to change. Existing changes in the environment and practice have included an explosion of information, stress on knowledge at the expense of skills/attitudes/critical thinking, increased access of information and health delivery systems by lay public, development and access to sub-specialties, technological and IT advances, costs of management (diagnostic and therapeutic), changes in disease trends (non-communicable diseases, behavioral/developmental disorders, malignancies, immunology, etc.), medico-legal litigations, emphasis on quality standards, improved patient safety, violence/anger against health personnel and the emergence of professional-ethical dilemmas to name a few.

The NMC's competency based education is organized using a framework of competencies (predefined abilities) that forms the backbone of the curriculum as defined outcomes. These competencies are defined as observable abilities of a health professional, integrating multiple components across all domains, cognitive, psychomotor skills, and affective. Identified competencies are to be measured and assessed to ensure their acquisition which in turn determines competence. Defined competencies in each domain facilitates education progressing from being a novice towards mastery with formative assessments (feedback) vital for success. Every domain will have weightage and the phenomenon of allowing the ability in one should not be allowed to compensate the lack of ability in another.

These changes are reflected in the review of Core Competencies keeping them mostly aligned with CBME Undergraduate efforts. Each competency will require Sub-competencies/milestones enabling both student and teacher monitor progress that is transparent making both accountable. Specific Learning Objectives that will be necessary to achieve (and assess) outcomes are certainly also required to complete the process. This document has been prepared by subject-content specialists of NMC. The Expert Group of the NMC had attempted to render uniformity without compromise to the purpose and content of the document. Compromise in purity of syntax has been made in order to preserve the purpose and content. This has necessitated retention of "domains of learning" under the heading "competencies

SUBJECT SPECIFIC OBJECTIVES

Goal

The goal of the MD Paediatrics post-graduate course on successful completion, is to mould the individual into a qualified Pediatrician who is a specialist doctor with the ability (competence) to assess the state of health; promote health; and diagnose as well as manage disease (acute or chronic, emergency or routine) in children of all ages from newborn to the adolescent.

Their expertise includes dealing with medical and surgical conditions of varied degrees of complexities providing a spectrum of care from prevention, promotion, resuscitation, emergency care, acute care, chronic care and procedures (diagnostic and therapeutic) including providing palliative care. Unlike in most adults, children go through changes in growth and development leading to anatomical, behavioral, and developmental changes that emphasizes that the Specialist incorporates this dynamic requirement into screening, assessments, diagnostic and therapeutic decisions. They will continue to play an important part in the health of the family and community especially through education and support of prevention of disease and health promotion since Paediatrics is child-centered and family-focused given the relationships and social structures of families. Pediatricians will also continue to provide consultative services to many other physicians across the specialties including Emergency, Burns, Plastic Surgery, Anesthesiologist, Surgeons, Infectious Disease, Community and Family Medicine.

SUBJECT SPECIFIC OBJECTIVES

The objectives of the postgraduate course (MD) in Paediatrics are to produce a competent pediatrician who:

- Acquires competencies relevant to all aspects of Paediatrics (newborn to adolescent) that are essential to function as a clinical expert in providing newborn and pediatric health services for the community at all levels.
- Recognizes the holistic health needs of healthy neonates, infants, children, and adolescents
- Performs responsibilities of the provision of clinical care in keeping with principles of the National Health Policy.
- Performs responsibilities in a professional and ethical manner.
- Acquires skills in effectively communicating not only with the health team but with the child, family, and the community
- Is actively involved in keeping oneself up to date with scientific advances in Paediatrics and Medicolegal aspects of practice.
- Is oriented to principles of research methodology enabling critical appreciation of published scientific evidence and contributing through scholarship
- Acquires skills to enable education of all stakeholders including health team members
- Acquires skills and understanding of dealing with health team members enabling optimizing system-based practice.

SUBJECT SPECIFIC COMPETENCIES

Towards achieving suitable outcomes certain Competencies are essential to be achieved, assessed that will enable the qualified professional to perform the role of a Paediatric Specialist.

Aligned with the NMC's existing Undergraduate CBME, the following are refined and identified as themes or roles mandatory to perform the responsibility as a Pediatric Specialist in the community after acquiring an MD Paediatric post-graduation:

1. Clinical Expert
2. Communicator

3. Professional
4. Scholar
5. Team Member

Core Competencies

(The term 'children' is hereby used to include all age groups from birth to 18 years - newborn, neonates, infants, toddlers, children and adolescents)

To perform each of these above roles as a Paediatrician, every role determines competencies which in turn requires Specific Learning Objectives covering all the domains of learning.

By the end of the MD Paediatric course, the postgraduate student should be able to:

1. Clinical Expert

1.1. Appreciate and recognize maternal and child health needs in the context of the health priority of the country at all levels ie. Individual, Community, Local, Regional, and National.

1.2. Apply an understanding of the determinants of child health at individual, community, and population levels in practice of disease prevention, health promotion and clinical care of all children.

1.3. Understand the existing inequities in accessibility to child friendly health, economics of child health and existing status of child health across gender, communities, region, and nation (eg. NHFS survey).

1.4. Participate in population/community efforts towards prevention, promotion, and disease control relevant and with implications for child health (ie. National Health Programs).

1.5. Appreciate and recognize the importance of nurturing care for the early growth and development as the very foundation of Paediatrics and help each child realize her/his optimal growth and development potential.

1.6. Actively support the optimization of quality of growth, development, and holistic health of children in care through education enhancing the promotive, preventive, and curative measures.

1.7. Provide continuum of care and rehabilitation for children afflicted by chronic disease.

1.8. Scientific Knowledge and Evidence

1.8.1. Apply an understanding of scientific basis, concepts, principles, and advances as the basis of health and disease in the screening, diagnosis, and management of all children including growth and development.

1.9. Clinical History/Examination

1.9.1. Demonstrate appropriate proficiency in basic clinical skills appropriate for children, ie. History, Physical Examination and Assessments of Growth/ Development/ Behavior, in arriving at the most likely clinical differential; in identifying precipitating or predisposing factors; prioritizing high risk versus low-risk conditions; and, those in need of emergency versus routine care.

1.9.2. Organize and analyze an authentic history and relevant examination towards a valid clinical assessment of health of all children including growth, development, and behavioral assessments.

1.10. Investigations

1.10.1. Order rational Investigations and interpret results keeping in mind cost effectiveness and purpose in child health (ie., confirming diagnosis that impacts management decisions).

1.11. Procedures/Interventions

1.11.1. Order, perform with safety and interpret results of procedures/ interventions that are cost-effective for diagnostic and therapeutic purposes in child health.

1.12. Critical Thinking

1.12.1. Demonstrate a logical clinical approach to diagnose children in health and disease in all settings.

1.12.2. Manage using appropriate resources all children in health and disease in settings not less than secondary level facilities

1.12.3. Demonstrate clinical reasoning at every step from gathering, organization, prioritization, analysis and creating logical diagnostic hypothesis from clinical data relevant to childhood (history to examination to investigations)

1.12.4. Formulate rational, judicious, and cost-effective plans (Investigation, Therapeutic and Counseling/Education plans) for all children in health and disease (acute and chronic) taking into consideration individual/ family circumstances, interpersonal dynamics, socioeconomic status, vulnerabilities, epidemiology, and population health factors.

1.12.5. Choose investigations and prescribes medications/interventions that are rational and cost-effective balancing benefits and costs in child health in the context of family status.

1.12.6. Critically appreciate scientific literature especially relevant to children under their care.

1.13. Responsiveness

1.13.1. Rapidly assess/screen, recognize and manage critically ill sick children prioritized for immediate attention.

1.13.2. Demonstrate sensitivity and appreciate the emotional and behavioral characteristics and needs of children while dealing with them

1.14. Quality of Care

1.14.1. Demonstrate practices that maximize child safety

1.14.2. Optimize safe working practices in child health delivery settings

1.14.3. Participate in incident reporting of adverse events and errors enabling quality improvement of child health

1.14.4. Participate in continuous Child Health Care related Quality Improvement measures especially patient related audits, recognition of gaps and implementation of interventions to improve quality

1.15. Advocacy

1.15.1. Responding to a Child's health needs by advocating for them

1.16. Documentation

1.16.1. Maintain Child health records of relevant demographic details clinical details, progress, interpretations, educational, monitoring and management decisions accurately and neatly organized

1.16.2. Provide relevant concise summaries and certification in completeness to authorized legal guardians of children

1.16.3. Maintain childhood morbidity and mortality data for audit purposes.

2. Communicator

2.1. Effective Communication

2.1.1. Demonstrate all aspects of effective and empathetic communication during most encounters with children and parents/guardians (listening skills, culturally appropriate verbal and non-verbal cues, simple understandable

language, allow questions, clarify answers and concise written communications for prescriptions and patient education)

2.1.2. Demonstrate mutually respectful communications with children/parents/guardians (verbal, telephonic, electronic and written) that is collaborative and effective between health system colleagues of all levels.

2.2. Effective Counselling

2.2.1. Provide professional assistance and guidance in assisting children/parents/ authorized legal guardians determine their autonomous decisions regarding their own health (especially related Diagnostic Interventions and Therapeutic options).

3. Professional

3.1. Responsibility

3.1.1. Demonstrate responsibility for all aspects of the conduct of child care, academic tasks and research in children undertaken.

3.1.2. Demonstrate social accountability consistent with community and professional expectations through active participation in child health relevant Community Outreach programs

3.1.3. Demonstrate an understanding of one's own limits and seeks assistance appropriately in dealing with children in health and disease.

3.2. Integrity

3.2.1. Demonstrate commitment with honesty for consistent and uncompromising adherence to moral and ethical principles and values in protecting child rights and wellbeing during care, academics, and research.

3.3. Compassion and empathy

3.3.1. Demonstrate the ability to understand and share the feelings of children and families while dealing with them as care providers.

3.3.2. Demonstrate the ability to understand and share the feelings of health team members while working with them for the good of children.

3.4. Stigma and Discrimination

3.4.1. Demonstrate ability to comprehend the differences in values and beliefs while respectfully continuing child health care without discrimination

3.5. Ethical principles

3.5.1. Recognize ethical conflicts specific for child health between principles of ethics and justifies options/decisions while discussing within health care team discussions.

3.5.2. Demonstrate respect for confidentiality in issues related to child health.

3.5.3. Demonstrate ability to honor the doctor-child/parent/legal guardian relationship in all dealings with respect ensuring due care especially avoiding all inappropriate behavior and activities that lead to conflicts of interest.

3.5.4. Demonstrate mutual respect for all members on the child health team and behaves equitably and collaboratively while dealing with them.

3.5.5. Demonstrate prioritization of child's welfare and community benefits over self when appropriate.

3.6. Medicolegal Law and Code of Ethics

3.6.1. Practice within the NMC's standards as prescribed by the Code of Ethics especially in dealings with children.

3.6.2. Practice within the Law of the land fulfilling legal requirements during the provision of care especially relevant to children.

4. Scholar

4.1. Research

4.1.1. Refer to evidence-based guidelines in the decision-making process for child care justifying limitations.

4.1.2. Understand research methodology and the creation of a research studies for child health.

4.1.3. Demonstrate the ability to critically appreciate the quality and implications of scientific literature justifying its application in the delivery of child health care.

4.1.4. Demonstrate an ability to identify pertinent research questions relevant to child health through active participation and involvement in research.

4.2. Academics

4.2.1. Demonstrate features of active adult learning through enthusiasm and displaying a positive attitude in the educational process while participating in educational activities to build child health care capacities (Intra- and inter-institutional).

4.2.2. Use appropriate educational techniques to promote health education amongst children/parents/legal guardians/community

4.2.3. Use appropriate educational techniques to facilitate learning of other child health care team members including undergraduates, nurses, paraclinical staff and peers

4.2.4. Maintain competency by keeping up to date with child health guidelines through continued medical education with scientific knowledge and skills to enable quality practice

4.3. Application

4.3.1. Apply child health expertise in an area of study that is published in academic journals

4.3.2. Apply child health expertise while participating in health education and community efforts

5. Team Member

5.1. Teams

5.1.1. Demonstrate an understanding of the roles and competencies of other health care providers dealing with child health.

5.1.2. Demonstrate the ability to engage and collaborate with all child health care team members keeping the patient at the center of all such collaboration.

5.1.3. Recognize and discuss in a non-judgmental way the roles of informal stakeholders as extended teams especially in child care planning (especially mature adolescent, extended family, alternative medicine practitioners, support networks, etc.)

5.1.4. Demonstrate knowledge of health care financing, implications for management and its application in assisting patient to access the best possible care through extended team networking while dealing with child health.

5.1.5. Maintain personal health and wellbeing not only of self but of team members.

5.2. Leaders

5.2.1. Demonstrate leadership and management skills enabling effective working as a child health team

5.2.2. Lead, manage, and participate as a member of an effective and efficient child health care team while collaborating respectfully either as leader or member.

5.2.3. Facilitate child health team capacity building of competencies by leading through conduct of effective education sessions for members of the health team learning.

5.2.4. Manage time and human resources efficiently and effectively to deliver optimal child health care.

SYLLABUS

Syllabus gives an outline and summary of topics to be covered in the MD Paediatric Course.

In Competency Based Education, outcomes are required to be defined, taught, learnt, and assessed that determines competence at the end of the course. Defined Outcomes should focus on what is expected practically in the "real world" by the professional performing roles of the expert physician. This syllabus is focused on all age group of children from neonates to toddlers to children to adolescents as per existing practice. The syllabus thus stresses on "real world presentation of symptoms and signs" and is categorized under the following:

A. Cognitive Domain
    a. Basic Sciences
    b. Approaches/Management of common symptoms/signs inclusive of analysis, interpretation, and application of investigations
    c. Specific Topics classified as per traditional systems
B. Psychomotor Domain
C. Affective Domain
D. Pedagogic and Research Skills

A) Predominant in Cognitive (Knowledge) Domain

a. Basic Sciences

- *Should be able to justify and apply in the practice of Paediatrics, an understanding of the fundamentals of basic sciences as listed below:*

1. Applied Anatomy

1.1. Embryogenesis of all organ systems
1.2. Central Nervous System

1.2.1. Structures, Functions, Clinical considerations

1.2.1.1. Cerebral Cortex
1.2.1.2. Corticospinal tracts
1.2.1.3. Extrapyramidal tracts
1.2.1.4. Cerebellar connections
1.2.1.5. Sensory tracts
1.2.1.6. Ventricles

1.3. Spinal Cord, Peripheral Nerves

1.3.1. Structures, Functions, Clinical considerations

1.3.1.1. Lower Motor Neuron

1.4. Bladder and Bowel control
1.5. Vascular supply – Principal arteries and veins
1.6. Extremities, Abdomen, Thorax, Head and Neck
1.7. Fetal circulation

2. Physiological basis and Pathophysiology in Health and Disease

2.1. Physical Growth
2.2. Temperature regulation
2.3. Acid Base Balance
2.4. Fluid Balance
2.5. Hematopoiesis
2.6. Hemostasis
2.7. Electrolyte balance
2.8. Bone mineralization: Calcium-Phosphate balance
2.9. Puberty
2.10. Renal function
2.11. Hepatic function
    2.11.1. Bilirubin
    2.11.2. Drug metabolism
2.12. Respiratory function
2.13. Cardiac function
2.14. Gastrointestinal
2.15. Endocrine functions
2.16. Developmental Milestones
2.17. Adolescence
2.18. Placenta functions
2.19. Fetal to Infant Transitions (Cardio-respiratory)
2.20. Nutrition
2.21. Allergy

3. Biochemical basis of health and disease

3.1. Cell biology
    3.1.1. Cell cycle
    3.1.2. Cell signaling
3.2. CHO metabolism
3.3. Lipid metabolism
3.4. Protein metabolism
3.5. TCA Cycle
3.6. Hemoglobin
3.7. Clinical Chemistry
    3.7.1. Vitamins
    3.7.2. Minerals
3.8. Plasma Proteins
3.9. Coagulation Pathway

4. Genetics and Molecular Medicine

4.1. Human Genome
4.2. Nucleic acids

4.2.1. Protein synthesis

4.3. Recombinant DNA Technology

4.3.1. Basic techniques
4.3.2. Applications

4.4. Chromosomal abnormalities

4.4.1. Pedigree charting

4.5. Prenatal/Postnatal diagnosis
4.6. Immunogenetics

4.6.1. HLA

5. Clinical Microbiology

5.1. Virology

5.1.1. Classifications
5.1.2. Diagnostics
5.1.3. Therapeutics
5.1.4. Resistance

5.2. Bacteriology

5.2.1. Classification
5.2.2. Endo/Exotoxins
5.2.3. Diagnostics
5.2.4. Therapeutics
5.2.5. Resistance
5.2.6. Antibiotic Stewardship

5.3. Mycology

5.3.1. Classification
5.3.2. Diagnostics
5.3.3. Therapeutics
5.3.4. Resistance

5.4. Parasitology (Protozoology and Helminthology)

5.4.1. Classification
5.4.2. Diagnostics
5.4.3. Therapeutics
5.4.4. Resistance

5.5. Waste disposal, sterilization, disinfection

5.5.1. Infection Control

6. Immunology

6.1. Immune response system

6.1.1. Innate, Adaptive
6.1.2. Cellular
6.1.3. Antibodies
6.1.4. Cytokines
6.1.5. Clinical considerations

6.2. Immunoglobulins

6.2.1. Types
6.2.2. Clinical considerations

6.3. Complement

6.3.1. Components
6.3.2. Pathways
6.3.3. Deficiencies
6.3.4. Clinical considerations

6.4. Hypersensitivity reactions

6.5. Blood group Immunology

6.5.1. ABO
6.5.2. Rh
6.5.3. Minor groups

6.6. Immunological assays

6.7. Science of Vaccinology

6.7.1. Vaccines
6.7.2. Classification
6.7.3. Schedule
6.7.4. Indications, contraindications
6.7.5. Adverse effects
6.7.6. Catch up doses

6.8. Immunodeficiency

6.8.1. Primary
6.8.2. Secondary

6.9. Autoimmune disease

6.9.1. Basis
6.9.2. Autoantibodies
6.9.3. Clinical considerations

6.10. Transplant Immunology

6.10.1. Stem cell
6.10.2. GVH disease
6.10.3. Solid organ transplant

6.11. Cancer Immunology

7. Pharmacology

7.1. Pharmacokinetics – common medications
7.2. Antimicrobials
7.3. Analgesia, sedation
7.4. Drug interactions
7.5. Adverse effects
7.6. Antidotes for poisons
7.7. Drug induced disease

8. Epidemiology

8.1. Rates
8.2. Principles of study design
8.3. Measures of effects
8.4. Association and causation
8.5. Diagnostic tests

9. Statistics

9.1. Distribution of data
9.2. Measures of Central tendency
9.3. Measures of dispersion
9.4. Probability distributions
9.5. Sampling
9.6. Statistical significance

10. Professionalism and Ethics

10.1. Professionalism

10.1.1. Clinical competencies
10.1.2. Effective communication
10.1.3. Understanding of Ethics
10.1.4. Accountability
10.1.5. Altruism
10.1.6. Excellence
10.1.7. Humanism

10.2. Ethics

10.2.1. Code of ethics
10.2.2. Principles of Ethics
10.2.3. Ethical workup
10.2.4. Doctor-Patient relationship
10.2.5. Confidentiality and privacy
10.2.6. Doctor-Doctor relationship

10.3. Medico-legal essentials

10.3.1. POSCO
10.3.2. Certifications
10.3.3. Documentation
10.3.4. Informed consent
10.3.5. MLC formalities

11. Pedagogy

11.1. How adults learn
11.2. Competencies and Specific Learning Objectives
11.3. Teaching Learning Methodologies
11.4. T-L Media including Power Point Presentations
11.5. Assessments- Formative and Summative

12. Management

12.1. Time Management
12.2. Conflict Management
12.3. Communication especially Listening

12.4. How to study – Lectures? Wards? Journal club?
12.5. Fundamentals of Counselling
12.6. Stress Management
12.7. Teamwork
12.8. Leadership

b. Approaches/Management of common symptoms/signsinclusive of analysis, interpretation, and application of investigations *(In every age group from newborn to adolescent)*

- ***Approaches*** *(Clinical and Investigation) of the following clinical symptoms/ signs*

Management *plans (Investigation, Treatment, Care, Counselling, Education, Follow Up, Rehabilitation Plans) of healthy children (section 1.1) and children with the following clinical symptoms/signs.*

1.1. Healthy Children

1.1.1. Healthy neonate
1.1.2. Healthy infant
1.1.3. Healthy child
1.1.4. Healthy adolescent

1.2. Cardiovascular Symptoms/Signs

1.2.1. Murmurs
1.2.2. Cyanosis
1.2.3. Syncope
1.2.4. Dizziness
1.2.5. Breathlessness
1.2.6. Palpitations
1.2.7. Chest Pain

1.3. Development (and Behavioral) Symptoms/ Signs

1.3.1. Normal development
1.3.2. Delayed milestones
1.3.3. Regression of milestones
1.3.4. Unusual behaviors
1.3.5. Poor scholastic performance
1.3.6. Deviations in sexuality
1.3.7. Dysmorphic features
1.3.8. Suicide attempt
1.3.9. Behavioral issues -disinterest, isolation, poor social interaction
1.3.10. Substance abuse
1.3.11. Abnormal eating behavior
1.3.12. Sleep disturbance
1.3.13. Breath holding spells
1.3.14. Multiple unexplained unrelated complaints
1.3.15. Technology dependence
1.3.16. Speech abnormalities

1.4. Dermatology

1.4.1. Neonatal skin lesions
1.4.2. Infantile skin lesions
1.4.3. Acquired skin rashes in childhood
1.4.4. Urticaria
1.4.5. Neurocutaneous presentations

1.5. Emergencies

1.5.1. Dehydration
1.5.2. Respiratory distress
1.5.3. Hypoxia
1.5.4. Shock
1.5.5. Incessant crying
1.5.6. Sick looking
1.5.7. Status epilepticus
1.5.8. Acute Severe Asthma
1.5.9. Trauma
1.5.10. Animal/human bite
1.5.11. Abuse
1.5.12. Cardio-pulmonary failure
1.5.13. Oliguria/Anuria
1.5.14. Raised intracranial pressure
1.5.15. Coma
1.5.16. Traumatic Brain Injury
1.5.17. Acute poisoning
1.5.18. Envenomation
1.5.19. Medico-legal conditions

1.6. Endocrine Symptoms

1.6.1. Abnormal stature
1.6.2. Hypoglycemia
1.6.3. Delayed puberty
1.6.4. Precocious puberty
1.6.5. Goiter

1.7. **Gastrointestinal (and Hepatic) Symptoms**

1.7.1. Tongue tie
1.7.2. Vomiting and regurgitation
1.7.3. Diarrhea – Acute
1.7.4. Diarrhea – Chronic, persistent, recurrent
1.7.5. Abdominal pain – Acute
1.7.6. Abdominal Pain - Recurrent
1.7.7. Constipation
1.7.8. Jaundice
1.7.9. Gastrointestinal bleed
1.7.10. Hepatomegaly
1.7.11. Splenomegaly
1.7.12. Hepatosplenomegaly
1.7.13. Encopresis
1.7.14. Abdominal distention

1.7.15. Abnormal Liver Function tests

1.8. Genital Symptoms

1.8.1. Atypical or ambiguous genitalia
1.8.2. Menstrual abnormalities
1.8.3. Injuries to genitalia
1.8.4. Foreskin, penile problems
1.8.5. Labial adhesions

1.9. Growth (and Nutrition related) Symptoms

1.9.1. Normal growth
1.9.2. Normal diet
1.9.3. Poor feeding in Infancy
1.9.4. Undernutrition
1.9.5. Failure to thrive
1.9.6. Overweight and obesity

1.10. Hematological Symptoms

1.10.1. Pallor
1.10.2. Bleeding manifestations
1.10.3. Lymphadenopathy
1.10.4. Thrombotic manifestations
1.10.5. Abnormal Hematological parameters including Pancytopenia

1.11. **Infectious (and Immunological) Symptoms**

1.11.1. Fever with focus
1.11.2. Fever without focus
1.11.3. Fever - persistent or recurrent
1.11.4. Exanthematous Fever
1.11.5. Recurrent infections
1.11.6. Hospital acquired infection
1.11.7. Vaccination Issues– complete, incomplete

1.12. Metabolic Symptoms

1.12.1. Acidosis – metabolic, respiratory
1.12.2. Alkalosis – metabolic, respiratory
1.12.3. Mixed Acid-Base disturbance
1.12.4. Dyselectrolytemia – Hypo/Hypernatremia, Hypo/Hyperkalemia, Hypo/hypercalcemia
1.12.5. Hyperammoniaemia
1.12.6. Hypoglycemia

1.13. **Musculoskeletal Symptoms**

1.13.1. Joint pains with or without swelling
1.13.2. Low back pain
1.13.3. Deformities of bone growth
1.13.4. Scoliosis

1.13.5. Growing Pains involving lower limbs

1.14. Neonatology

1.14.1. Term gestation
1.14.2. Prematurity
1.14.3. Low birth weight
1.14.4. Neonatal Jaundice
1.14.5. Ill/Sick
1.14.6. Neonatal seizures
1.14.7. Neonatal respiratory distress
1.14.8. Neonatal Apnea
1.14.9. Neonatal Shock
1.14.10. Metabolic/electrolyte disturbances – Glucose, Sodium, Potassium, Calcium, Bicarbonate, Lactate, Ammonia
1.14.11. Feed Intolerance
1.14.12. Spinal/Cranial abnormalities
1.14.13. Post NICU follow up
1.14.14. HIV-HepB-Syphilis exposure/infection
1.14.15. Inadequate breast milk
1.14.16. Antenatal detected renal abnormalities

1.15. **Neurological Symptoms**

1.15.1. Seizures
1.15.2. Altered sensorium/Coma
1.15.3. Motor weakness
1.15.4. Incessant Irritability
1.15.5. Headache
1.15.6. Abnormal Head circumference
1.15.7. Sensory abnormalities
1.15.8. Abnormal gait
1.15.9. Ataxia
1.15.10. Facial weakness
1.15.11. Involuntary movements

1.16. **Ophthalmological Symptoms**

1.16.1. Red eye
1.16.2. Watering of eye
1.16.3. Discharge from eye
1.16.4. Poor vision
1.16.5. White reflex
1.16.6. Deviation of eyes

1.17. **Otorhino-laryngology Symptoms**

1.17.1. Nasal discharge, Nasal congestion, Sneezing
1.17.2. Sore Throat
1.17.3. Ear Pain/discharge
1.17.4. Tonsillar hypertrophy
1.17.5. Epistaxis
1.17.6. Impaired hearing

1.18. **Renal and Urological Symptoms**

1.18.1. Enuresis
1.18.2. Dysuria
1.18.3. Proteinuria
1.18.4. Hematuria
1.18.5. Edema
1.18.6. Hypertension
1.18.7. Dyselectrolytemia
1.18.8. Polyuria
1.18.9. Scrotal and Inguinal swelling
1.18.10. Oliguria/Anuria

1.19. **Respiratory Symptoms**

1.19.1. Cough
1.19.2. Breathlessness
1.19.3. Noisy breathing - snoring, stridor, wheeze
1.19.4. Hemoptysis

1.20. Community Situations

1.20.1. Vaccination camps
1.20.2. School Health Checkups
1.20.3. Outbreaks of childhood diseases

1.21 Analysis, interpretation, and application of Investigations

1.21.1. Radiology X-rays (Chest AP/PA/Lateral, abdomen, spine, extremities)
1.21.2. Contrast X-rays (Micturating cystourethrogram)
1.21.3. Ultrasound (Lung: Consolidation, Left Heart failure, effusion; Circulation: Intravascular Volume; Neonatal Brain: Hydrocephalus, Intracranial Collections; Central veins: Patency for US guided central lines; Lymphadenopathy: For US guided FNAC aspirations)
1.21.4. CT scan with/without contrast (Brain: Cerebral edema, Midline shift, Meningitis, Encephalitis, ADEM, Hemorrhage, Infarction, SOLS, Hydrocephalus)
1.21.5. MRI scan (Brain: Gross White vs Grey matter degeneration)
1.21.6. HIDA Scan

1.22. Microbiology

1.22.1. Grams stain of CSF, Pus, Peritoneal fluid
1.22.2. Ziehl Neilson Stain of Sputum, Pus
1.22.3. Hanging drop for motile cholera
1.22.4. PCR reports for infectious disease diagnosis
1.22.5. Culture and sensitivity reports of body fluids

1.23. Pathology

1.23.1. Pathology reports of human tissue

1.24. Routine labs

1.24.1. Hematology reports of Blood counts, peripheral smear, Bleeding and Coagulation parameters, basic immunology
1.24.2. Urine routine analysis

1.25. Biochemical

1.25.1. Biochemical routine (Electrolytes, Calcium-Phosphate, Renal, Liver profiles, Arterial/venous Blood Gases)
1.25.2. Inborn error of metabolism newborn screening reports
1.25.3. Endocrine (Glucose related, Thyroid related, Hormonal assays, Lipid profiles)

1.26. Electrophysiological Studies

1.26.1. Electrocardiogram

1.27. Lung Function Tests
1.27.1. Spirometry

C. Specific Topics

Understanding the definition, epidemiology, etiopathogenesis, clinical presentation, investigations, complications, differential diagnosis, treatment, prognosis, prevention, follow up and rehabilitation, if required, of the following, but not limited to:

1. Overview

1.1. History of Paediatrics
1.2. State of Health of Children – Global, Regional and India
1.3. Evidence-based Care in Pediatrics
1.4. WHO's Sustainable Development Goals
1.5. National Programs relevant to Child Health
1.6. Ethics in the Care of Children
1.7. Medico-legal aspects relevant to Paediatrics including: Documentation (Initial History/Examination/Differential Sheet, Progress (SOAP, Problem Oriented), Death and other Certification, Informed Consent, Wound Certificates, POSCO, Financial Receipts, Outpatient/In Patient Registers)

2. Genetics

2.1. Inheritance Patterns
2.2. Genetic Counseling
2.3. Prevention of Genetic Disorders
Management of Genetic Disorders

3. Metabolic Disorders

3.1. Approach to Inborn Errors of Metabolism
3.2. Approach to Hypoglycemia
3.3. Defects of Amino Acid Metabolism

3.3.1. Phenylalanine
3.3.2. Urea Cycle Disorders

3.4. Defects of Lipid Metabolism

3.4.1. Organic Acidemias
3.4.2. Fatty Acid Oxidation
3.4.3. Mitochondrial Disorders
3.4.4. Peroxisomal Disorders
3.4.5. Lysosomal Storage Disorders
3.4.6. Gaucher Disease
3.4.7. Niemann-Pick Disease

3.5. Defects of Carbohydrate Metabolism

3.5.1. Glycogen Storage Disease

3.6. GM1 and GM2 Gangliosidosis
3.7. Mucopolysaccharidoses
3.8. Porphyrias
3.9. Newborn Screening

4. Immunology

4.1. Laboratory Diagnosis of Immune-mediated Diseases
4.2. Primary Immunodeficiency Disorders

4.2.1. Antibodies
4.2.2. Cellular
4.2.3. Multiple types

4.2.3.1. SCID (Severe combined immunodeficiency)

4.3. Phagocytic system

4.3.1. Neutrophils
4.3.2. Leukopenia
4.3.3. Leuocyctosis

4.4. Complement pathway

4.4.1. Complement deficiencies

4.5. Intravenous Immunoglobulin
4.6. Multisystem Inflammatory Syndrome of Childhood

5. Allergy

5.1. Basis of Allergy
5.2. Allergic rhinitis
5.3. Atopic dermatitis
5.4. Urticaria, Angioedema
5.5. Anaphylaxis
5.6. Asthma
5.7. Serum sickness
5.8. Drug allergies
5.9. Food allergies

6. Fluid and Electrolytes

6.1. Body Fluids – Composition, Osmolality

6.2. Fluid Therapy - Maintenance, Replacement
6.3. Sodium
6.4. Potassium
6.5. Calcium
6.6. Magnesium
6.7. Phosphorus
6.8. Acid-base Abnormalities

7. Therapeutics

7.1. Principles of Drug Therapy
7.2. Administration of Medications
7.3. Pre-anesthesia Checkup
7.4. Procedural sedation
7.5. Analgesia

8. Acutely Ill

8.1. Assessment and Triage
8.2. Cardiopulmonary Resuscitation

8.2.1. Basic Life Support
8.2.2. Pediatric Advanced Life Support

8.3. Minor Injuries – Abrasions, Lacerations

9. Pediatric Intensive Care

9.1. Shock
9.2. Respiratory Failure
9.3. Pediatric Acute Respiratory Distress Syndrome
9.4. Ventilation – Non-Invasive and Invasive
9.5. Sedation, Analgesia and Paralysis
9.6. Nutrition in Intensive Care
9.7. ECMO
9.8. Concepts of Futility, Do not Resuscitate, Withdrawal of Care
9.9. Palliative Care
9.10. Death

10. Toxins

10.1. Clinical Approach to a Poisoned Child
10.2. Poisonings by Common Drugs
10.3. Hydrocarbon Poisoning
10.4. Poisoning in the Household
10.5. Corrosive Poisoning
10.6. Snakebite
10.7. Insect Stings including Bee, Wasp, Scorpion Sting

11. Injuries

11.1. Poly Trauma: Stabilization, Triage, and Transport
11.2. Drowning/Submersion Injuries
11.3. Animal-related Injuries

11.4. Burn Injuries
11.5. Cold Injuries

12. Neonatology

12.1. Neonatal Mortality and Morbidities
12.2. Fetal Physiology and Growth
12.3. Maternal Influences on Fetus
12.4. Transition of the Fetus to Newborn
12.5. Intrauterine diagnosis and management of Fetal disease
12.6. Organization of Neonatal Care

13. Normal Newborn

13.1. Delivery Room Care of the Newborn
13.2. Newborn Resuscitation
13.3. Assessment of the Newborn
13.4. Care of the Normal Newborn
13.5. Maintenance of Temperature
13.6. Breastfeeding and Lactation Management

14. Disorders of Weight and Gestation in Neonates

14.1. Low Birthweight

14.1.1. Feeding of Low-birth weight
14.1.2. Intrauterine Growth Restriction

14.2. Prematurity
14.3. Post term
14.4. Large for Gestational Age

15. High-risk Newborn

15.1. Recognition of High-risk neonate
15.2. Multiple-gestational pregnancies
15.3. Birth Injuries
15.4. Perinatal Asphyxia
15.5. Jaundice in the newborn
15.6. Infant of Diabetic Mother
15.7. Neonatal Hypoglycemia
15.8. Anemia and Polycythemia
15.9. The Bleeding Neonate
15.10. Hemorrhagic Disease of the
15.11. Thrombocytopenia in the Newborn
15.12. Cyanosis in the Newborn
15.13. Necrotizing Enterocolitis
15.14. Retinopathy of Prematurity
15.15. Dyselectrolytemia, Hypocalcemia, Hypermagnesemia
15.16. Neonatal Transport
15.17. Follow-up of the High-risk Neonate

16. Neonatal Infections

16.1. Neonatal Sepsis – Early and Late
16.2. Superficial Infections in Neonates
16.3. Neonatal Meningitis
16.4. Deep-seated Infections in Neonates
16.5. Neonatal Tetanus
16.6. Intrauterine Infections

17. Neonatal Neurological Problems

17.1. Seizures in the Neonates
17.2. Hypoxic Ischemic Encephalopathy
17.3. Intra-cranial/ventricular Hemorrhage
17.4. Peripheral nerve injuries

18. Neonatal Respiratory Problems

18.1. Approach to a Neonate with Respiratory Distress
18.2. Neonatal Apnea Neonatal Ventilation
18.3. Hyaline Membrane Disease
18.4. Transient Tachypnea of the Newborn
18.5. Meconium Aspiration Syndrome
18.6. Pulmonary Air Leaks in the Newborn
18.7. Persistent Pulmonary Hypertension (PPHN)
18.8. Pulmonary Hemorrhage
18.9. Bronchopulmonary Dysplasia
18.10. Extra pulmonary air leaks

19. Neonatal Cardiac Problems

19.1. Neonate with a murmur
19.2. Patent ductusarteriosus
19.3. Ductus dependent shunts

20. Hematological disorders in Neonates

20.1. Anemia in Neonate
20.2. Hemolytic Disease
20.3. Polycythemia
20.4. Hemorrhagic Disease

21. Congenital Malformations

21.1. Esophageal Atresia and Tracheoesophageal Fistula
21.2. Diaphragmatic Hernia and Eventration
21.3. Gastrointestinal and Abdominal Malformation
21.4. Genitourinary Malformations
21.5. CNS Malformations
21.6. Single Umbilical Artery, Polydactyly, Skin Tags

22. Growth: Normal and Abnormal

22.1. Normal Growth
22.2. Factors Affecting Growth

22.3. Assessment of Physical Growth
22.4. Disorders of Growth (Failure to Thrive, Overweight and Obesity)
22.5. Abnormalities of Stature

23. Development and Developmental Delay

23.1. Theories of Development and Behaviour
23.2. Laws of Development
23.3. Factors Affecting Development
23.4. Normal Development
23.5. Screening of Development and Behaviour
23.6. Approach to Diagnosis of Developmental Delay: Developmental Screening and Surveillance
23.7. Global Developmental Delay
23.8. Specific Developmental Delays
23.9. Cerebral Palsy
23.10. Intellectual Disability
23.11. Learning disabilities
23.12. Hearing Impairment
23.13. Mental Retardation

24. Behavior and Learning

24.1. Evaluation of Mental Well-Being
24.2. Psychosocial assessments
24.3. Technology Dependence
24.4. Bulling
24.5. Common Behavioral Problems
24.6. Tantrums and Breath-Holding
24.7. Enuresis and Encopresis
24.8. Sleep Medicine
24.9. Common Speech, Language, and Communication Disorders
24.10. Learning Disorders
24.11. Dyslexia
24.12. Attention-Deficit Hyperactivity Disorder
24.13. Oppositional Defiant and Conduct Disorders
24.14. Autism Spectrum Disorder
24.15. Rett Syndrome
24.16. Anorexia Nervosa and Bulimia
24.17. Anxiety Disorders
24.18. Suicide
24.19. Management of Psychological Illness

25. Nutrition and Nutritional Disorders

25.1. Nutritional Requirements
25.2. Nutritive Values of Indian Foods
25.3. Infant and Young Child Feeding
25.4. Adolescent Feeding
25.5. Feeding during Childhood and Food Allergy
25.6. Undernutrition: Prevalence and Etiology

25.7. Pathophysiology of Undernutrition
25.8. Malnutrition – Moderate and Severe Acute
25.9. Vitamin A
25.10. Vitamin B Complex
25.11. Vitamin C and Scurvy
25.12. Vitamin D, Nutritional Rickets, and Hypervitaminosis D
25.13. Iodine Deficiency Disorders
25.14. Zinc in Child Health
25.15. Trace Elements in Nutrition and Health
25.16. Fluorosis
25.17. Nutritional Rehabilitation including Diet Prescription
25.18. Enteral and Parenteral Nutrition
25.19. National Nutrition Programs

26. Immunization

26.1. Basic Concepts of Vaccination
26.2. Vaccine Administration Practices
26.3. Scheduling of Vaccines
26.4. Vaccine Storage and Cold Chain
26.5. Adverse Events following Immunization
26.6. BCG Vaccine
26.7. Poliovirus Vaccines
26.8. Diphtheria, Tetanus, and Pertussis Vaccines
26.9. Hepatitis B Vaccine
26.10. HaemophilusInfluenzae Type B (HIB) Vaccines
26.11. Measles Vaccine
26.12. Rubella Vaccines
26.13. Mumps Vaccine
26.14. Typhoid Fever Vaccines
26.15. Japanese Encephalitis Vaccine
26.16. Rabies Vaccines
26.17. Pneumococcal Vaccines
26.18. Rotavirus Vaccines
26.19. Cholera Vaccines
26.20. Varicella Vaccine
26.21. Hepatitis A Vaccine
26.22. Meningococcal Vaccine
26.23. Seasonal and Pandemic Influenza Vaccines
26.24. Human Papillomavirus Vaccines
26.25. Dengue Vaccines
26.26. Yellow Fever Vaccine
26.27. Combination Vaccines
26.28. Covid-19 Vaccines
26.29. Immunization in Special Situations

27. Adolescence

27.1. Gender, Sexual Identity and Sexuality
27.2. Psychosocial Development

28. Health Issues in Adolescence

- 28.1. Factors Influencing Adolescent Health
- 28.2. Adolescent Nutrition
- 28.3. Mental Health
- 28.4. Injuries, Violence, and Suicide
- 28.5. Menstrual Disorders
- 28.6. Polycystic Ovary Syndrome
- 28.7. Teenage Pregnancy
- 28.8. Sexually Transmitted Infections
- 28.9. Substance Abuse
  - 28.9.1. Alcohol
  - 28.9.2. Tobacco
  - 28.9.3. Other substances

29. Care of the Adolescents

- 29.1. Adolescent Counseling
- 29.2. Promoting Health of Adolescents
- 29.3. Adolescent Friendly Health Services

30. Infectious Diseases

- 30.1. Epidemiology of Infectious Diseases
- 30.2. Laboratory Diagnosis of Infection
- 30.3. Microbiome and Child Health
- 30.4. Antimicrobial Resistance
- 30.5. Infection Control and Prevention

31. Fever

- 31.1. Fever: General Principles of Management
- 31.2. Fever with/without focus
- 31.3. Fever of Unknown Origin
- 31.4. Infections in Immunocompromised conditions

32. Bacterial Infections

- 32.1. Natural History of Bacterial Infection
- 32.2. Principles of Antibiotic Therapy
- 32.3. Gram Positive Infections
  - 32.3.1. Streptococcal Infections
    - 32.3.1.1. Pneumococcal Infections
    - 32.3.1.2. Streptococcal Group A
    - 32.3.1.3. Streptococcal Group B
    - 32.3.1.4. Streptococcal Non A, Non B
  - 32.3.2. Staphylococcal Infections
  - 32.3.3. Enterococcus
  - 32.3.4. Diphtheria
  - 32.3.5. Nocardiosis
  - 32.3.6. Listeria monocytogenes
  - 32.3.7. Actinomycosis

32.4. Gram Negative Infections

32.4.1. Haemophilusinfluenzae
32.4.2. Neisseria
32.4.3. Pseudomonas
32.4.4. Pertussis
32.4.5. Salmonella

32.4.5.1. Nontyphoidal Salmonellosis
32.4.5.2. Enteric Fever

32.4.6. Shigella
32.4.7. Escherichia coli
32.4.8. Cholera
32.4.9. Campylobacter
32.4.10. Yersina
32.4.11. Aeromonas
32.4.12. Brucella
32.4.13. Moraxella catarrhalis
32.4.14. Helicobacter pylori

32.5. Anaerobic Bacterial

32.5.1. Clostridium tetani
32.5.2. Clostridium botulinum
32.5.3. Clostridium difficile

32.6. Spirochetal Infections

32.6.1. Treponemapallidum
32.6.2. Leptospirosis
32.6.3. Borrelia

32.6.3.1. Lyme
32.6.3.2. Relapsing Fever

32.7. Mycoplasma

32.7.1. Mycoplasma pneumoniae

32.8. Chlamydia

32.8.1. Chlamydia pneumonia
32.8.2. Chlamydia trachomatis
32.8.3. Psittacosis

32.9. Rickettsia

32.9.1. Spotted Fever
32.9.2. Scrub Typhus
32.9.3. Typhus
32.9.4. Ehrlichiosis
32.9.5. Q fever

33. Mycobacterial Infections

33.1. Childhood Tuberculosis: Epidemiology, Pathogenesis, Clinical Features, and Prevention

33.2. Diagnostic Tools for Tuberculosis in Children
33.3. Antitubercular Drugs and RNTCP
33.4. Guidelines for Childhood Tuberculosis
33.5. Drug Resistant Tuberculosis
33.6. Atypical Mycobacterial Infections
33.7. Leprosy

34. Viral Diseases

34.1. Epidemiology of Viral Infections
34.2. Principles of Antiviral Drugs
34.3. Measles
34.4. Mumps
34.5. Rubella
34.6. Roseola
34.7. Epstein-Barr
34.8. Cytomegalovirus
34.9. Influenza
34.10. Parainfluenza
34.11. Respiratory syncytial virus
34.12. Human metapneumovirus
34.13. Rhinovirus
34.14. Adenovirus
34.15. Coronavirus
34.16. Rotavirus
34.17. Human Papillomavirus
34.18. Arbovirus

34.18.1. Japanese Encephalitis
34.18.2. Other Encephalitis
34.18.3. Tick-borne Encephalitis
34.18.4. Chikungunya
34.18.5. Zika

34.19. Varicella-zoster
34.20. Herpes Simplex
34.21. Rabies
34.22. Parvovirus Infections
34.23. NonpolioEnteroviral Infections
34.24. Poliomyelitis
34.25. Viral Hepatitis
34.26. HIV
34.27. Human Lymphotrophic 1 and 2
34.28. Dengue
34.29. Yellow Fever
34.30. Ebola, Hanta
34.31. Rabies
34.32. Viral Hemorrhagic Fevers
34.33. Covid-19

35. Protozoal Disease

35.1. Epidemiology of Parasitic Infections
35.2. Principles of Antiparasitic therapy
35.3. Malaria
35.4. Leishmaniasis
35.5. Giardiasis
35.6. Amebiasis
35.7. Filariasis
35.8. Cryptosporidiosis
35.9. Toxoplasmosis
35.10. Helminthiasis

35.10.1. Hookworm Infestation
35.10.2. Ascariasis
35.10.3. Trichuriasis
35.10.4. Enterobiasis
35.10.5. Strongyloidiasis
35.10.6. Tapeworm Diseases
35.10.7. Cysticercosis
35.10.8. Trichinosis
35.10.9. Toxocara
35.10.10. Intestinal, Liver, and Lung Flukes
35.10.11. Hydatid Disease: Echinococcosis
35.10.12. Schistosomiasis

36. Fungal Infections

36.1. Fungi
36.2. Principles of Antifungal Therapy
36.3. Candidiasis
36.4. Aspergillosis
36.5. Malassezia
36.6. Cryptococcosis
36.7. Coccidioidomycosis
36.8. Blastomycosis
36.9. Histoplasmosis
36.10. Mucormycosis
36.11. Pneumocystis Jirovecii

37. Diarrheal Illnesses

37.1. Acute Watery Diarrhea
37.2. Dysentery
37.3. Cholera
37.4. Persistent Diarrhea
37.5. Chronic Diar*rhea*
37.6. Antibiotic Associated Diarrhea

38. Gastrointestinal Disorders

38.1. Anatomy and Physiology
38.2. Common Symptoms of Gastrointestinal Diseases
38.3. Oral Cavity disorders

38.3.1. Malocclusion
38.3.2. Dental Caries
38.3.3. Periodontal disease
38.3.4. Common lesions of soft palate
38.3.5. Cleft Lip and Cleft Palate
38.3.6. Diseases of Salivary Glands

38.4. Esophageal atresia, Tracheoesophageal Fistula
38.5. Disorders of Esophageal Motility
38.6. Gastroesophageal Reflux
38.7. Esophagitis
38.8. Hiatal Hernia
38.9. Ingestions

38.9.1. Foreign Body
38.9.2. Caustic

38.10. Infantile Hypertrophic Pyloric Stenosis, Volvulus, Duplication
38.11. Duodenal Obstruction
38.12. Malrotation
38.13. Intestinal duplication
38.14. Meckel Diverticulum
38.15. Chronic obstructive pseudoobstruction
38.16. Chronic Abdominal Pain—Functional Abdominal Pain
38.17. Acid Peptic Disease
38.18. Pancreas – Function, Tests

38.18.1. Pancreatitis
38.18.2. Treatment of Pancreatic insufficiency

38.19. Constipation
38.20. Hirschsprung Disease
38.21. Malabsorption Disorders

38.21.1. Assessment
38.21.2. Celiac
38.21.3. Enzyme Deficiencies

38.22. Inflammatory Bowel Disease
38.23. Intestinal Obstruction
38.24. Intussusception
38.25. Appendicitis
38.26. Abdominal Tuberculosis
38.27. Ascites
38.28. Umbilical Hernia
38.29. Inguinal Hernia
38.30. Testicular Torsion
38.31. Anorectal Disorders

38.31.1. Anal Fissure
38.31.2. Hemorrhoids
38.31.3. Prolapse

38.31.4. Pilonidal sinus
38.31.5. Anorectal malformations

38.32. Cyclic vomiting

39. Hepatobiliary Diseases

39.1. Liver Function Tests
39.2. Neonatal Cholestasis
39.3. Portal Hypertension
39.4. Gastrointestinal Bleeding
39.5. Metabolic Liver disease

39.5.1. Wilson
39.5.2. Others

39.6. Liver Abscess
39.7. Viral Hepatitis
39.8. Chronic Liver Disease
39.9. Acute Liver Failure
39.10. Autoimmune Hepatitis
39.11. Drug induced Hepatitis
39.12. Cystic disease of Liver
39.13. Liver transplantation
39.14. Liver Tumors
39.15. Peritoneum

39.15.1. Ascites
39.15.2. Peritonitis

39.16. Epigastric hernia

40. Disorders of Hematopoietic System

40.1. The Hematopoietic System
40.2. Anemia: Etiology and Classification
40.3. Inadequate Production

40.3.1. Physiological anemia of infancy
40.3.2. Congenital Bone Marrow Failure
40.3.3. Aplastic Anemia
40.3.4. Iron Deficiency Anemia
40.3.5. Megaloblastic Anemia
40.3.6. Anemia of Chronic disease
40.3.7. Congenital dyserthropoietic anemia

40.4. Hemolytic Anemia

40.4.1. Hemoglobinopathies

40.4.1.1. Sickle Cell Disease
40.4.1.2. Thalassemia

40.4.2. RBC Membrane Defects
40.4.3. Red Blood Cell Enzyme Defects
40.4.4. Immune Hemolytic Anemia

40.5. Polycythemia

40.6. Hemorrhagic and Thrombotic disorders

40.6.1. Coagulation Disorders
40.6.2. Hemophilia
40.6.3. Other Clotting Factor Deficiencies
40.6.4. Von Willebrand Disease
40.6.5. Thrombotic disorders
40.6.6. Disseminated Intravascular Coagulation

40.7. Platelet

40.7.1. Immune Thrombocytopenia
40.7.2. Hemolytic Uremic Syndrome
40.7.3. Thrombotic Thrombocytopenic Purpura
40.7.4. Kasabach- Merritt Syndrome
40.7.5. Platelet Function Defects

40.8. Blood Component Therapy

40.9. Spleen

40.9.1. Splenomegaly
40.9.2. Splenectomy

40.10. Lymphatics

40.10.1. Lymphadenopathy

41. Respiratory Diseases

41.1. Congenital Malformations of the Upper Respiratory Tract
41.2. Epistaxis
41.3. Nasal Polyps
41.4. Allergic Rhinitis
41.5. Otitis Media
41.6. Common Cold
41.7. Acute Pharyngitis
41.8. Retropharyngeal abscess
41.9. Sinusitis
41.10. Tonsils and Adenoids
41.11. Community Acquired Pneumonia
41.12. Pleural effusion, Empyema
41.13. Bronchiectasis
41.14. Pneumothorax, Pneumomediastinum, Pyopneumothorax
41.15. Skeletal deformities of Chest
41.16. Obstructive Sleep Apnea
41.17. Congenital Malformations of the Respiratory Tract
41.18. Congenital disorders of Lung
41.19. Croup, Epiglottitis, Laryngitis, Tracheitis
41.20. Bronchiolitis
41.21. Alpha-1 Antitrypsin Deficiency

41.22. Aspiration Syndromes
41.23. Preschool Wheeze and Bronchial Asthma
41.24. Aerosol Therapy
41.25. Pneumonia
41.26. Parapneumonic Effusion and Empyema
41.27. Pneumothorax and Air Leaks
41.28. Persistent and Recurrent Pneumonia
41.29. Interstitial Lung Disease
41.30. Hemoptysis and Alveolar Bleeds
41.31. Primary Ciliary Dyskinesia
41.32. Cystic Fibrosis
41.33. Bronchiectasis
41.34. Lung Abscess
41.35. Foreign Body Aspiration
41.36. Central Hypoventilation
41.37. Acute Respiratory Distress Syndrome
41.38. SIDS

42. Cardiovascular Disorders

42.1. Genetic Basis of Heart Diseases
42.2. Chest Skiagram in Heart Disease
42.3. Electrocardiogram
42.4. Echocardiography
42.5. Congestive Heart Failure
42.6. Cardiac Malposition
42.7. Acyanotic Congenital Heart Disease, Left to Right shunt

42.7.1. Ventricular Septal Defects
42.7.2. Patent DuctusArteriosus
42.7.3. Atrial Septal Defects
42.7.4. PAPVC
42.7.5. Atrioventricular Septal Defects

42.8. Acyanotic Congenital Heart Disease, Obstructive

42.8.1. Pulmonary Valve Stenosis
42.8.2. Coarctation of Aorta
42.8.3. Pulmonary Venous Hypertension

42.9. Acyanotic Congenital Heart Disease, Regurgitation

42.9.1. Mitral Valve Prolapse

42.10. Cyanotic Congenital Heart Disease, reduced Pulmonary flow

42.10.1. Tetralogy of Fallot and Variants
42.10.2. Tricuspid Atresia
42.10.3. Double outlet Right Ventricle
42.10.4. Ebstein Anomaly

42.11. Cyanotic Congenital Heart Disease, Increased Pulmonary flow

42.11.1. Transposition of Great Arteries and variants
42.11.2. TruncusArteriosus
42.11.3. TAPVC
42.11.4. Hypoplastic Left Heart Syndrome

42.12. Others

42.12.1. Anomalies of the Aortic Arch
42.12.2. Pulmonary Arterial Hypertension

42.13. Acquired Heart Disease

42.13.1. Acute Rheumatic Fever
42.13.2. Rheumatic Heart Disease
42.13.3. Infective Endocarditis
42.13.4. Myocardial Diseases: Myocarditis and Cardiomyopathies
42.13.5. Diseases of the Pericardium
42.13.6. Kawasaki disease

42.14. Cardiac Arrhythmias
42.15. Cardiac Emergencies
42.16. Heart Failure
42.17. Systemic Hypertension

43. Disorders of the Kidney and Urinary Tract

43.1. Investigations for Kidneys and Urinary Tract
43.2. Congenital Anomalies of Kidneys and Urinary Tract

43.2.1. Cystic Kidney Diseases

43.3. Glomerular Disease

43.3.1. Glomerulonephritis

43.3.1.1. Acute Poststreptococcal Glomerulonephritis
43.3.1.2. Membranous Nephropathy
43.3.1.3. Membranoproliferative Glomerulonephritis
43.3.1.4. RapidlyProgressive Glomerulonephritis

43.3.2. IgA nephropathy
43.3.3. Alport syndrome

43.4. Systemic Vasculitis and Lupus Nephritis
43.5. Goodpasture Disease
43.6. Henoch-SchonleinPurpura Nephritis
43.7. Hemolytic Uremic Syndrome
43.8. Toxic Nephropathy
43.9. Tubulointerstitial Disease

43.9.1. Pyelonephritis
43.9.2. Tubulointerstitial nephritis
43.9.3. Papillary necrosis
43.9.4. Acute Tubular Necrosis

43.10. Vascular Disease

43.10.1. Renal vein Thrombosis
43.10.2. Hypercalciuria
43.10.3. Nephrocalcinosis

43.11. Infections

43.11.1. Urinary Tract Infection
43.11.2. Cystitis
43.11.3. Urethritis
43.11.4. Hemorrhagic cystitis
43.11.5. Pyelonephritis

43.12. Proteinuria

43.12.1. Transient, Orthostatic
43.12.2. Nephrotic Syndrome

43.13. Tubular Disorders

43.13.1. Renal Tubular Disorders
43.13.2. Nephrogenic Diabetes Insipidus
43.13.3. Bartter Syndrome
43.13.4. Gitelman Syndrome

43.14. Renal Failure

43.14.1. Acute Kidney Injury
43.14.2. Chronic Kidney disease
43.14.3. End-stage renal disease
43.14.4. Renal Replacement Therapy
43.14.5. Renal Transplantation

43.15. Renal Calculi
43.16. Refractory Rickets
43.17. Hypertension
43.18. Vesicoureteral Reflux
43.19. Voiding Disorders
43.20. Penile anomalies

44. Gynecological Issues

44.1. Vaginal bleeding in prepubertal children
44.2. Breast concerns
44.3. Female genital mutilation

45. Neurological Disorders

45.1. Approach to Neurological Disorders including localization
45.2. Cerebrospinal Fluid and Neurophysiology
45.3. Neuroimaging
45.4. Congenital Anomalies

45.4.1. Neural Tube Defects and Spinal Cord Malformations

45.4.2. Microcephaly
45.4.3. Brain Malformations
45.4.4. Hydrocephalus
45.4.5. Craniosynostosis

45.5. Seizures

45.5.1. Febrile Seizures
45.5.2. Unprovoked Seizures and Epilepsy

45.5.2.1. Generalized
45.5.2.2. Focal
45.5.2.3. Reflex Seizures

45.5.3. Treatment of Seizures
45.5.4. Status Epilepticus
45.5.5. Nonepileptic Paroxysmal Disorders

45.6. Headaches

45.6.1. Migraine
45.6.2. Tension Headache
45.6.3. Secondary Headaches

45.7. Neurocutaneous Syndromes
45.8. Movement Disorders
45.9. Encephalopathies

45.9.1. Cerebral Palsy
45.9.2. Autoimmune
45.9.3. Mitochondrial

45.10. Neurodegenerative Disorders

45.10.1. Grey versus White Matter
45.10.2. Sphingolipidosis
45.10.3. Neuronal CeroidLipofuscinoses
45.10.4. Adrenoleucodystrophy

45.11. Demyelinating Disorders

45.11.1. Acute Disseminated Encephalomyelitis
45.11.2. Optic Neuritis
45.11.3. Transverse Myelitis
45.11.4. Multiple Sclerosis
45.11.5. Autoimmune and Paraneoplastic

45.12. Stroke

45.12.1. Arterial versus Venous

45.13. CNS Vasculitis
45.14. CNS Infections

45.14.1. Acute Pyogenic Meningitis
45.14.2. Tuberculosis of the Central Nervous System

45.14.3. Viral Meningoencephalitis
45.14.4. Neurocysticercosis
45.14.5. Brain Abscess

45.15. PseudotumorCerebri
45.16. Coma and Raised Intracranial Pressure
45.17. Brain Death
45.18. Infantile Tremor Syndrome
45.19. Neurometabolic Disorders
45.20. Spinal Cord Disorders
45.21. Traumatic Brain Injury
45.22. Neuro-Rehabilitation

45.22.1. Traumatic Brain Injury
45.22.2. Spinal cord Injury
45.22.3. Spasticity
45.22.4. Brachial plexus injury
45.22.5. Meningomyelocele
45.22.6. Disabled Child

46. Neuromuscular Disorders

46.1. Approach to Diagnosis of Neuromuscular Disorders
46.2. Floppy Infant
46.3. Congenital Muscle Disorders

46.3.1. Congenital Myopathies
46.3.2. Arthrogryposis

46.4. Muscular Dystrophies

46.4.1. Duchenne and Becker Muscular Dystrophy
46.4.2. Myotonic Muscular Dystrophy
46.4.3. Limb Girdle Muscular Dystrophy
46.4.4. Fascio-scapulo-humeral Muscular Dystrophy

46.5. Endocrine/Toxic Myopathies
46.6. Metabolic Myopathies

46.6.1. Periodic Paralysis
46.6.2. Glucogenoses
46.6.3. Mitochondrial
46.6.4. Lipid

46.7. Neuromuscular Transmission Disorders

46.7.1. Myasthenia Gravis
46.7.2. Spinal Muscular Atrophy
46.7.3. Motor Neuron Disease

46.8. Hereditary Motor Sensory Neuropathies

46.8.1. Peroneal Muscular Atrophy
46.8.2. Refsum Disease
46.8.3. Fabry Disease
46.8.4. Leukodystrophy

46.8.5. Acute Flaccid Paralysis

46.9. Toxic Neuropathies
46.10. Autonomic Neuropathy
46.11. Guillain-Barré Syndrome
46.12. Bell Palsy

47. Disorders of the Endocrine System

47.1. Physiology of Neuroendocrinology
47.2. Hypopituitarism

47.2.1. Growth Hormone Deficiency and Resistance
47.2.2. Polyuria, Diabetes Insipidus and Syndrome of Inappropriate Secretion of ADH

47.3. Thyroid Disorders

47.3.1. Thyroid Hormone Physiology
47.3.2. Hypothyroidism
47.3.3. Thyroiditis
47.3.4. Hyperthyroidism
47.3.5. Goiter and Thyroid Nodules
47.3.6. Newborn Screening for Congenital Hypothyroidism

47.4. Parathyroid Disorders

47.4.1. Bone Mineral and Hormone Physiology
47.4.2. Calcium Disorders
47.4.3. Metabolic Rickets
47.4.4. Disorders with Bone Fragility
47.4.5. Hypoparathyroidism
47.4.6. Pseudo hypothyroidism
47.4.7. Hyperparathyroidism

47.5. Pubertal Development

47.5.1. Normal Puberty
47.5.2. Delayed Puberty
47.5.3. Precocious Puberty

47.6. Adrenal Gland Disorders

47.6.1. Normal Development and Physiology of the Adrenal Gland
47.6.2. Congenital Adrenal Hyperplasia
47.6.3. Adrenal Insufficiency
47.6.4. Cushing Syndrome
47.6.5. Primary Aldosteronism
47.6.6. Pheochromocytoma

47.7. Gonad Disorders

47.7.1. Testicular Hypofunction
47.7.2. Ovarian Hypofunction
47.7.3. Gynecomastia
47.7.4. Disorders of Sex Development

47.7.5. Cryptorchidism and Micropenis

47.8. Glucocorticoid Use and Withdrawal

47.9. Diabetes Mellitus

47.9.1. Classification of Diabetes Mellitus
47.9.2. Type 1 Diabetes Mellitus
47.9.3. Type 2 Diabetes Mellitus
47.9.4. Acute and Chronic Complications of Diabetes Mellitus

47.10. Monogenic Obesity
47.11. Hyperlipidemia
47.12. Endocrine Consequences of Thalassemia Major
47.13. Endocrine Effects of Radiation and Cancer Chemotherapy
47.14. Adult Consequences of IUGR and Preterm Birth

48. Malignancies in Children

48.1. Epidemiology and Biology of Cancers
48.2. Principles of Diagnosis and Therapy of Cancer
48.3. Leukemias

48.3.1. Acute Lymphoblastic Leukemia
48.3.2. Acute Myelogenous Leukemia
48.3.3. Chronic Myelogenous Leukemia
48.3.4. Infantile Leukemia

48.4. Lymphoma

48.4.1. Hodgkin Lymphoma
48.4.2. Non-Hodgkin Lymphoma

48.5. Brain Tumors
48.6. Neuroblastoma
48.7. Wilms Tumor
48.8. Soft Tissue Tumors
48.9. Bone Tumors
48.10. Retinoblastoma
48.11. Gonadal, Germ cell neoplasms
48.12. Hemangioma
48.13. Lymphangiomas, Cystic Hygromas
48.14. Thyroid Tumours
48.15. Nasopharyngeal Carcinoma
48.16. Adrenal Tumours
48.17. Histiocytosis

48.17.1. LCH
48.17.2. HemophagocyticLymphohistiocytosis

48.18. Oncological Emergencies and Supportive Care
48.19. Hematopoietic Stem Cell Transplant

49. Rheumatological Disorders

49.1. Approach to a Child with Rheumatological Disorder
49.2. Laboratory Investigations for Rheumatological Disorders
49.3. Drugs and Principles of Management for Rheumatic Disorders
49.4. Juvenile Idiopathic Arthritis
49.5. Reactive, Post-Infectious Arthritis
49.6. Systemic Lupus Erythematosus: Clinical Features and Diagnostic Criteria
49.7. Management of Systemic Lupus Erythematosus
49.8. Juvenile Dermatomyositis
49.9. Large Vessel Vasculitis: Takayasu Arteritis
49.10. Medium Vessel Vasculitis: Kawasaki Disease and PolyarteritisNodosa
49.11. Small Vessel Vasculitis:Henoch-SchönleinPurpuraand ANCA Associated Vasculitis
49.12. Juvenile Scleroderma
49.13. Antiphospholipid Syndrome
49.14. Growing Pains

50. Common Eye Abnormalities

50.1. Common Visual Problems
50.2. Congenital Anomalies
50.3. Refractive Errors
50.4. Cornea and Conjunctiva
50.5. Uveitis
50.6. Cataract and Lens
50.7. Glaucoma
50.8. Optic Nerve and Pupil
50.9. Strabismus and Motility Disorders
50.10. Eyelid, Orbit, and Lacrimal Sac
50.11. Ocular Injuries
50.12. Orbital Infections
50.13. Ocular Manifestations of Systemic Disorders

51. Common ENT Problems

51.1. Hearing Loss
51.2. Congenital malformations of Ear
51.3. External Otitis
51.4. Otitis Media
51.5. Mastoiditis
51.6. Inner Ear

52. Common Skin Problems

52.1. Skin of the Newborn: Physiological and Pathological Changes
52.2. Care of Skin in the Newborn
52.3. Infections and Infestations
52.4. Congenital Cutaneous Malformations
52.5. Vitiligo and Other Hypopigmentary Diseases
52.6. Atopic Dermatitis
52.7. Contact Dermatitis

52.8. Urticaria and Mastocytosis
52.9. Psoriasis, GianottiCrosti Syndrome
52.10. AcanthosisNigrans
52.11. Cutaneous Drug Reactions
52.12. Cutaneous Manifestations of Nutritional Deficiency
52.13. Cutaneous Manifestations of Collagen Vascular Diseases
52.14. Neurocutaneous Syndromes
52.15. Vesiculobullous Disorders
52.16. Papulosquamous Disorders
52.17. Ichthyosis
52.18. Genetic Cutaneous Disorders
52.19. Hair Disorders
52.20. Nail Disorders
52.21. Infections of Skin

52.21.1. Impetigo
52.21.2. Subcutaneous Infections
52.21.3. Staphylococcal Scalded Skin Syndrome
52.21.4. Ecthyma
52.21.5. Fungal Infections
52.21.6. Viral Infections
52.21.7. Arthropod bites
52.21.8. Scabies
52.21.9. Pediculosis
52.21.10. Acne

53. Disorders of Bones and Joints

53.1. Assessment of the Locomotor System
53.2. Deformities of Foot and Toes

53.2.1. Congenital TalipesEquinovarus

53.3. Torsional deformities of Limb
53.4. Leg Length discrepancies
53.5. Transient Monoarticularsynovitis
53.6. Legg-Calvé-Perthes Disease
53.7. Neck Problems

53.7.1. Torticollis
53.7.2. Cervical anomalies

53.8. Scoliosis and Kyphosis
53.9. Developmental Dysplasia of the Hip (DDH)
53.10. Osteomyelitis
53.11. Septic Arthritis
53.12. Osgood-Schlatter Disease
53.13. Arthrogryposis
53.14. Injuries to Bones/Joints
53.15. Skeletal Dysplasia
53.16. Osteogenesisimperfecta
53.17. Marfan Syndrome
53.18. Metabolic Bone Disease

53.18.1. Hypo/Hyperphosphatemia
53.18.2. Osteoporosis

54. Vulnerable Children

54.1. Street Children
54.2. Child Labor
54.3. Child Abuse and Neglect
54.4. Adoption: Medical and Legal Issues
54.5. Rights of the Child

55. Environmental Health

55.1. Climate Change and its impact on Health
55.2. Air Pollution and its impact on Health
55.3. Biomedical Waste Management

56. Community Pediatrics

56.1. Indicators of Child Health
56.2. Environment and Child Health
56.3. Lead Poisoning
56.4. Adoption
56.5. Travel Medicine
56.6. Protection of Children from Sexual Offences ACT 2012
56.7. Rights of People With Disability Act 2016
56.8. National Programs for Child Health as relevantto Natonal Health Mission including RBSK.
56.9. Integrated Management of Neonatal and ChildhoodIllness-Facility (IMNCI-F)
56.10. Investigation of an Outbreak

57. Quality Assessment and Improvement

57.1.1. Point of Care Quality Improvement

B. Psychomotor Domain

- *Should be able to perform independently in the practice of Paediatrics, the following diagnostic and therapeutic interventions as listed below:*

1. Physical Examination

1.1. Measurement of Vitals
1.2. Measurement of Anthropometry
1.3. General physical examination
1.4. Physical Examination of Systems
1.5. Development (Screening) Assessment
1.6. Behavioral (Screening) Assessment
1.7. Sexual Maturity Assessment
1.8. Newborn Assessment including gestational assessments
1.9. Breastfeeding Assessment of Position and Attachment
1.10. Motor Disability Assessment

1.11. Autism Spectrum Disorder Screening
1.12. Fundus examination
1.13. Middle ear examination
1.14. Throat examination
1.15. Triage - Rapid assessment of Airway, Breathing and Circulation
1.16. Hand hygiene
1.17. Biomedical Waste disposal guidelines

2. Non-Invasive Monitoring

2.1. Pulse oximetry
2.2. Electrocardiogram
2.3. Vital Data Monitor

3. Procedures – Diagnostic

3.1. Informed Consent
3.2. Aseptic measures for all invasive procedures
3.3. Sampling

3.3.1. Venous blood
3.3.2. Arterial blood
3.3.3. Capillary blood

3.4. Vascular Access and cannulation

3.4.1. Intravenous – Peripheral
3.4.2. Intravenous - Central
3.4.3. Intraosseous
3.4.4. Intraarterial
3.4.5. Umbilical Vein

3.5. Diagnostic Taps

3.5.1. Pleural
3.5.2. Peritoneal
3.5.3. CSF
3.5.4. Pericardial
3.5.5. Joint fluid

3.5.6. Subdural
3.5.7. Ventricular

3.6. Urinary Catheterization
3.7. Urine collection

3.7.1. Mid-stream sampling
3.7.2. Catheter sampling
3.7.3. Suprapubic puncture

3.8. Tuberculin Skin Test
3.9. Antibiotic Test Dose
3.10. Feeding/Ryles Tube

3.10.1. Insertion

3.10.2. Gastric Aspiration
3.10.3. Feeds
3.10.4. Stomach wash

3.11. Respiratory

3.11.1. Naso, Pharyngeal and Nasopharyngeal swab collection

3.12. Suppository insertion
3.13. Per rectal exam
3.14. Inspection of Vulva/Vagina
3.15. Aspiration/Biopsy

3.15.1. Bone marrow
3.15.2. Liver
3.15.3. Kidney
3.15.4. FNAC Lymph node

3.16. Ultrasound – Lung (B line, Effusion), Circulation (IVC Volume), Vascular access (Central venous), Soft Tissue (Pus)
3.17. Blood Group/Type
3.18. Smears

3.18.1. Malaria Parasite Smear/Rapid Antigen Test
3.18.2. Peripheral Blood Smear
3.18.3. CSF/Pus Grams Stain
3.18.4. Sputum Ziehl Neilson Smear

3.19. Urine dipstick
3.20. Stool Hanging drop
3.21. Glucometer Blood Sugar
3.22. Shake test (Newborn gastric aspirate)
3.23. Electrocardiogram
3.24. Specific Screening/Assessment Tools

3.24.1. Gestation Assessments
3.24.2. Anthropometric measurements and Growth charting
3.24.3. Peak Flow Meter Measurement
3.24.4. HEADSS screening (Adolescence)
3.24.5. DDST screening (Development Assessment)
3.24.6. Assessment of Sexual Maturity using Tanner's
3.24.7. M-CHAT-R screening (Autism Assessment)
3.24.8. GMSCF Assessment of Motor Disability (Cerebral Palsy)
3.24.9. Pain assessment

4. Procedures – Therapeutic

4.1.Informed Consent
4.2.Prescriptions/Medication Orders
4.3.Neonatal Resuscitation Programincluding intubation
4.4.Basic Life Support
4.5.Advanced Paediatric Life Support including intubation

4.6.Heimlich, Foreign Body Removal
4.7.Exchange Transfusion
4.8.Stomach wash
4.9.Injections

- 4.9.1. Intravenous
- 4.9.2. Intramuscular
- 4.9.3. Subcutaneous
- 4.9.4. Intradermal

4.10. Infusions

- 4.10.1. IV bolus
- 4.10.2. Intravenous
- 4.10.3. Intraosseous
- 4.10.4. Blood Component Transfusion

4.11. Respiratory

- 4.11.1. Meter dose inhalation with or without Spacer/Mask
- 4.11.2. Nebulization
- 4.11.3. Airway Insertion – Nasopharyngeal, Oropharyngeal
- 4.11.4. Needle Cricothyroidotomy
- 4.11.5. Oxygen delivery methods
- 4.11.6. HFNC/CPAP/Non-Invasive Ventilation
- 4.11.7. Ventilation – Conventional
- 4.11.8. Intercostal drainage
- 4.11.9. Surfactant Administration (INSURE)

4.12. Spinal infusion/injection
4.13. Therapeutic Ascitic Tap
4.14. Peritoneal dialysis
4.15. Phototherapy
4.16. Incision and Drainage
4.17. Dressings
4.18. Sling
4.19. Transport onto and off stretcher
4.20. Neonatal Temperature Warm Chain Measures

- 4.20.1. Wrapping up Newborn
- 4.20.2. Kangaroo Mother Care

4.21. Immunization Cold Chain Measures

- 4.21.1. Refrigerator
- 4.21.2. Vaccine carrier

4.22. Restraining a child
4.23. Transporting a child
4.24. Early Interventional Therapy
4.25. Chest Physiotherapy

Milestones to be achieved on Psychomotor Skills through Year 1 to 3.
O-Observe PS-Perform under supervision PI-Perform ndependently

Milestones	1st Year	2nd Year	3rd Year
1. Physical Examination			
1.1. Measurement of Vitals	PI		
1.2. Measurement of Anthropometry	PI		
1.3. General physical examination	PI		
1.4. Physical Examination of Systems	PI		
1.5. Development (Screening) Assessment	O, PS	PI	
1.6. Behavioral (Screening) Assessment	O	PS	PI
1.7. Sexual Maturity Assessment	O, PS	PI	
1.8. Newborn Assessment including gestational assessments	PI		
1.9. Breastfeeding Assessment	PI		
1.10. Motor Disability Assessment	O	PS	PI
1.11. Autism Spectrum Disorder Screening	O	PS	PI
1.12. Fundus examination	PI		
1.13. Middle ear examination	PI		
1.14. Throat examination	PI		
1.15. Triage - Rapid assessment of ABC	PI		
1.16. Hand hygiene	PI		
1.17. Biomedical Waste disposal guidelines	PI		
2. Non-Invasive Monitoring			
2.1. Pulse oximetry	PI		
2.2. Electrocardiogram	PI		
2.3. Vital Data Monitor	PI		
3. Procedures – Diagnostic			
3.1. Informed Consent	PI		
3.2. Aseptic measures for all procedures	PI		
3.3. Sampling			
3.3.1. Venous blood	PI		
3.3.2. Arterial blood	PI		

3.3.3. Capillary blood	PI		
3.4. Vascular Access and cannulation			
3.4.1. Intravenous – Peripheral	PI		
3.4.2. Intravenous - Central	O	PS	PI
3.4.3. Intraosseous	PI		
3.4.4. Intraarterial	O	PS	PI
3.4.5. Umbilical Vein	PI		
3.5. Diagnostic Taps			
3.5.1. Pleural	PS	PI	
3.5.2. Peritoneal	PI		
3.5.3. CSF	PI		
3.5.4. Pericardial	O	PS	PI
3.5.5. Joint fluid	O	PS	PI
3.5.6. Subdural	O, PS	PI	
3.5.7. Ventricular	O	PS	PI
3.6. Urinary Catheterization	PI		
3.7. Urine collection			
3.7.1. Mid-stream sampling	PI		
3.7.2. Catheter sampling	PI		
3.7.3. Suprapubic puncture	PI		
3.8. Tuberculin Skin Test	PI		
3.9. Antibiotic Test Dose	PI		
3.10. Feeding/Ryles Tube			
3.10.1. Insertion	PI		
3.10.2. Gastric Aspiration	PI		
3.10.3. Feeds	PI		
3.10.4. Stomach wash	PI		
3.11. Respiratory			
3.11.1. Naso, Pharyngeal, NP swab collection	PI		
3.12. Suppository insertion	PI		
3.13. Per rectal exam	O	PS	PI

3.14. Inspection of Vulva/Vagina	PI		
3.15. Aspiration/Biopsy			
3.15.1. Bone marrow	O, PS	PI	
3.15.2. Liver	O	PS	PI
3.15.3. Kidney	O	PS	PI
3.15.4. FNAC Lymph node	O	PS	PI
3.16. Ultrasound – Lung (B line, Effusion), Circulation (IVC Volume), Vascular access (Central venous), Soft Tissue (Pus)	O	O, PS	PS
3.17. Blood Group/Type	O, PS	PI	
3.18. Smears			
3.18.1. Malaria Parasite Smear/Rapid Antigen Test	O, PS	PI	
3.18.2. Peripheral Blood Smear	O, PS	PI	
3.18.3. CSF/Pus Grams Stain	O, PS	PI	
3.18.4. Sputum Ziehl Neilson Smear	O, PS	PI	
3.19. Urine dipstick	PI		
3.20. Stool Hanging drop	O, PS	PI	
3.21. Glucometer Blood Sugar	PI		
3.22. Shake test (Neon gastric aspirate)	PI		
3.23. Electrocardiogram	PI		
3.24. Specific Screening/Assessment Tools			
3.24.1. Gestation Assessments	PI		
3.24.2. Anthropometric measurements and Growth charting	PI		
3.24.3. Peak Flow Meter Measurement	PI		
3.24.4. HEADSS screening (Adolescence)	O, PS	PI	
3.24.5. DDST screening (Development Assessment)	O, PS	PI	
3.24.6. Assessment of Sexual Maturity using Tanner's	O, PS	PI	
3.24.7. M-CHAT-R screening (Autism Assessment)	O	PS	PI
3.24.8. GMSCF Assessment of Motor Disability (Cerebral Palsy)	O	PS	PI

3.24.9. Pain assessment	PI		
4. Procedures – Therapeutic			
4.1. Informed Consent	PI		
4.2. Prescriptions/Medication Orders	PI		
4.3. Neonatal Resuscitation Program including ET	PI (BVM)	PI (ET)	
4.4. Basic Life Support	PI		
4.5. Advanced Paediatric Life Support including ET	PI (BVM)	PI (ET)	
4.6. Heimlich, Foreign Body Removal	PI		
4.7. Exchange Transfusion	O	PS	PI
4.8. Stomach wash	PI		
4.9. Injections			
4.9.1. Intravenous	PI		
4.9.2. Intramuscular	PI		
4.9.3. Subcutaneous	PI		
4.9.4. Intradermal	PI		
4.10. Infusions			
4.10.1. IV bolus	PI		
4.10.2. Intravenous	PI		
4.10.3. Intraosseous	PI		
4.10.4. Blood Component Transfusion	PI		
4.11. Respiratory			
4.11.1. Meter dose inhalation with or without Spacer/Mask	PI		
4.11.2. Nebulization	PI		
4.11.3. Airway Insertion – Nasophy, Orophy	PI		
4.11.4. Needle Cricothyroidotomy	O	PS	PI
4.11.5. Oxygen delivery methods	PI		
4.11.6. HFNC/CPAP/Non-Invasive Ventilation	O, PS	PI	
4.11.7. Ventilation – Conventional, High Freq (HFV)	O	PS	PI (Not HFV)
4.11.8. Intercostal drainage	O, PS	PI	
4.11.9. Surfactant Administration	O, PS	PI	

	(INSURE)			
4.12.	Spinal infusion/injection	O	PS	PI
4.13.	Therapeutic Ascitic Tap	O, PS	PI	
4.14.	Peritoneal dialysis	O	PS	PI
4.15.	Phototherapy	PI		
4.16.	Incision and Drainage	O	PS	PI
4.17.	Dressings	PI		
4.18.	Sling	PI		
4.19.	Transport onto and off stretcher	PI		
4.20.	Neonatal Temperature Warm Chain	PI		
4.20.1.	Wrapping up Newborn	PI		
4.20.2.	Kangaroo Mother Care	PI		
4.21.	Immunization Cold Chain Measures			
4.21.1.	Refrigerator	PI		
4.21.2.	Vaccine carrier	PI		
4.22.	Restraining a child	O, PS	PI	
4.23.	Transporting a child	O, PS	PI	
4.24.	Early Interventional Therapy	O	PS	PI
4.25.	Chest Physiotherapy	O, PS	PI	

C. Predominant in Affective Domain

Should be able to effectively and empathetically……..

1. Communication – Child/Attender/Guardian

1.1. Elicit a relevant and appropriate historyfrom an attender/child including family and support systems

1.2. Engage and explainsin appropriate language the plan (diagnostic and management including economics of plans)to an attender/child

1.3. Explain the prognosis of the child's condition

1.4. Educatea Parent, an attendant/guardian/child with regards disease/, cultural, and spiritual understanding associated with health care delivery complication prevention, health promotion, and management keeping illustrating ethical ---?

1.5. Counsel towards an Informed Consent/Assent

1.6. Communicate disturbing/bad news including death

1.7. Demonstrates communication skills to appropriately word reports, professional opinions, patient education and counseling with regards

1.7.1. Health and Disease condition with management plan

1.7.2. Nutrition - Breastfeeding, complimentary feeding and nutrition using a Growth chart

1.7.3. Immunization – On schedule, catch up including costs and advantages/disadvantages

1.7.4. Lifestyle

1.7.4.1. Dietary

1.7.4.2. Habits

1.7.5. Genetic risks of relevant inherited conditions

1.7.6. Options for management and future approach in care with advantages and disadvantages

1.7.7. Rights and responsibilities

1.8. Demonstrates knowledge or applies an understanding of psychological, social, and economic factors which are pertinent to the delivery of health care.

1.9. Demonstrates and effectively engages the patient and / or family in all communication.

1.10. Demonstrates ability to provide patient, family and community education through written material especially simple patient information leaflets

Should be able to effectively and respectfully……..

2. Communication – Health Team members

2.1. Communicate with all members of the health care team

2.2. Communicate with other members of the profession

2.3. Communicate with allied professionals associated with Health care

Should be able to ……..

3. Professionalism and Ethical Behaviour

3.1. Demonstrates Professional Conduct in patient care and research

3.1.1. Demonstrate respect for the Doctor-Patient relationship

3.1.2. Demonstrate respect for the Doctor-Health Care Team Member relationship

3.1.3. Demonstrateadherence to confidentiality and patient privacy in all communications in and outside the place of work.

3.1.4. Demonstrate respect of a patient's rights and decisions including the right to information and second opinion.

3.1.5. Demonstrate behaviour aligned with MCI/NMC code of ethics in all related dealings

3.1.6. Demonstrates personal and social responsibility/accountability in the provision ofhealth care at an individual, community and population level

3.1.7. Demonstrate an awareness of economic costs of health care in all dealings with patients.

3.1.8. Demonstrate adherence to research ethics guidelines in the conduct of patient related research.

3.1.9. Demonstrates work ethics while working in a health care team.

3.1.10. Demonstrates truthfulness, honesty and integrity in all interactions.

3.1.11. Provides care that surpasses personal beliefs and prejudices

3.1.12. Demonstrates appropriate etiquette in dealings with patients, relatives and other health personnel

3.2. Demonstrates behavior that is Ethical and bound by the Law of the land

3.2.1. RecognizesEthical conflicts and dilemmas seeking solutions to reduce conflicts and do the right thing.

3.2.2. Complies with legal requirements while dealing with child health and includes issues dealing with the Industry Conflict, MTP Act,PCPNDT act, Child Abuse, Child labour, Legal adoption, Consent and Assent.

D. Pedagogic and Research Skills

Should be able to effectively ……..

1. **Pedagogic Skills**

1.1. Conduct a small group learning session (Theory and Practical) using appropriate tools

1.2. Create and use an effective Powerpoint Presentation

1.3. Present to a large group

Should be able to effectively ……..

2. **Research Skills**

2.1. Search scientific literature and critically appraise the evidence using standard study design checklists enabling application to clinical care.

2.2. Justify the application of the findings of a research study in clinical practice (Diagnostic and Therapeutic Studies)

2.3. Develop a research hypothesis supported by scientific literature review, design an appropriate study, implement the methodology, generate results by analyzing data, and draw appropriate conclusions.

2.4. Should be able to present or/and publish a paper based on the conducted research.

TEACHING AND LEARNING METHODS

General principles

Acquisition of competencies being the keystone of doctoral medical education, such training should be skills oriented. Learning in the program, essentially autonomous and self-directed, and emanating from academic and clinical work, shall also include assisted learning. The formal sessions are meant to supplement this core effort.

All students joining the postgraduate (PG) courses shall work as full-time (junior) residents during the period of training, attending not less than 80% of the training activity during the calendar year, and participating in all assignments and facets of the educational process. They shall maintain a logbook for recording the training they have undergone, and details of the procedures done during laboratory and clinical postings in real time.

Teaching-Learning methods

This should include a judicious mix of demonstrations, symposia, journal clubs, clinical meetings, seminars, small group discussion, bed-side teaching, case-based learning, simulation-based teaching, self-directed learning, integrated learning, interdepartmental meetings and any other collaborative activity with the allied departments. Methods with exposure to the applied aspects of the subject relevant to basic/clinical sciences should also be used. **The suggested examples of teaching-learning methods are given below but are not limited to these.**

A. Lectures: Didactic lectures should be used sparingly. A maximum of 10 lectures per year in the concerned PG department is suggested. All postgraduate trainees are encouraged to attend such lectures. Lectures can cover topics such as:

1. Subject-related important topics as per Paediatric requirements

2. Recent advances
3. Research methodology and biostatistics
4. Undergraduate/Postgraduate medical curriculum
5. Teaching and assessment methodology.

Topic numbers 3, 4, 5 can be done during research methodology/biostatistics and medical education workshops in the institute.

B. Journal club: Minimum of once in 1- 2 weeks is suggested.

Topics will include presentation and critical appraisal of original research papers published in peer reviewed indexed journals. The presenter(s) shall be assessed by faculty and grades recorded in the logbook.

C. Student Seminar: Minimum of once in 1-2 weeks is suggested.

Important topics should be selected as per subject requirements and allotted for in-depth study by a postgraduate student. A teacher should be allocated for each seminar as faculty moderator to help the student prepare the topic well. It should aim at comprehensive complete evidence-based review of the topic. The student should be graded by the faculty and peers. Symposium, Colloquium and Seminars may overlap to enhance involvement and active participation of postgraduates.

D. Student Symposium: Minimum of once every 3 months.

A broad topic of significance should be selected, and each part shall be dealt by one postgraduate student. A teacher moderator should be allocated for each symposium and moderator should track the growth of students. The symposium should aim at an evidence-based exhaustive review of the topic. All participating postgraduates should be graded by the faculty and peers. Symposium, Colloquium and Seminars may overlap to enhance involvement and active participation of postgraduates.

E. Bedside clinics: Minimum - once a week.

Clinics/bedside teaching should be coordinated and guided by faculty from the department. Various methods like DOAP (Demonstrate, Observe, Assist, Perform), simulations in skill lab, and case-based discussions etc. are to be used. Faculty from the department should participate in moderating the teaching-learning sessions during clinical rounds.

F. Interdepartmental colloquium

Faculty and students must attend monthly meetings between the main Department and other department/s on topics of current/common interest or clinical cases. Symposium, Colloquium and Seminars may overlap to enhance involvement and active participation of postgraduates.

G. a. Rotational clinical / community / institutional postings

Final decision that determines "external" postings outside the primary department will differ according to department needs, feasibility, sub-speciality availability and accessibility. Apart for mandatory postings, 'external' postings listed below are highly recommended (desirable) to expose postgraduates to allied Pediatric sub-specialities given existing trends in practice. Specific Learning Outcomes need to be defined for each of these postings even assessed keeping in mind the Competency based curriculum and their future professional roles as Pediatricians.

Rotations are listed below:

Mandatory Postings

- Paediatric emergency (minimum 1 month a year)
- Neonatology (NICU) (minimum 3 months a year)
- Intensive Care (PICU) (minimum 2 months a year)
- District Residency Programme with participation in Community Outreach Child Health Programs (at least 3 months over the entire course; 3rd or 4th or 5th semester; See Section G-b below).

Desirable postings based on need, availability, accessibility, and feasibility and may be innovatively integrated into schedule of posting to optimize learning experiences.

- Subspecialities Outpatient Clinics / observing- assisting in emergency
    - Clinical
        - Child Psychiatry
        - Pediatric Surgery
        - Developmental Pediatrics
        - Pediatric Nephrology
        - Pediatric Hemato-oncology
        - Pediatric Cardiology
        - Pediatric Gastroenterology
        - Pediatric Rheumatology/Immunology/Allergy
        - Genetic
        - Pediatric Pulmonology
        - Pediatric Dermatology
        - Pediatric Endocrinology
        - Adolescent Health

- DOTS, PPTCT, ART center with pediatric exposure
- Microbiology diagnostic Lab
- Radiology including CT/MRI
- Forensic Medicine especially Child related
- Neuro-rehabilitation (PMR, Physiotherapy, Occupational Therapy)

G b.Posting under "District Residency Programme" (DRP):

All postgraduate students pursuing MD/MS in broad specialities in all Medical Colleges/Institutions shall undergo a compulsory rotation of three months in District Hospitals/District Health System as a part of the course curriculum, as per the Postgraduate Medical Education (Amendment) Regulations (2020). Such rotation shall take place in the 3rd or 4th or 5th semester of the Postgraduate programme and the rotation shall be termed as "District Residency Programme" and the PG medical student undergoing training shall be termed as "District Resident".

Every posting should have its defined learning objectives. It is recommended that the departments draw up objectives and guidelines for every posting offered in conjunction with the collaborating department/s or unit/s. This will ensure that students acquire expected competencies and are not considered as an additional helping hand for the department / unit in which they are posted. The PG student must be tagged along with those of other relevant departments for bedside case discussion/basic science exercises as needed, under the guidance of an assigned faculty.

H. Teaching research skills

Writing a thesis should be used for inculcating research knowledge and skills. All postgraduate students shall conduct a research project of sufficient depth to be presented to the University as a postgraduate thesis under the supervision of an eligible faculty member of the department as guide and one or more co-guides who may be from the same or other departments.

In addition to the thesis project, every postgraduate trainee shall participate in at least one additional research project that may be started or already ongoing in the department. It is preferable that this project will be in an area different from the thesis work. For instance, if a clinical research project is taken up as thesis work, the additional project may deal with community/field/laboratory work. Diversity of knowledge and skills can thereby be

reinforced. There should be periodic department review of the thesis work, as per following schedule:

- End of 6 months — Submission of protocol
- During 2ndyear — Mid-term presentation
- 6 months prior to examination — Final presentation; submission

I. Training in teaching skills

MEU/DOME should train PG students in education methodologies and assessment techniques. The PG students shall conduct UG classes in various courses and a faculty shall observe and provide feedback on the teaching skills of the student.

J. Log book

During the training period, the postgraduate student should maintain a Log Book indicating the duration of the postings/work done in Wards, OPDs, Casualty and other areas of posting. This should indicate the procedures assisted and performed and the teaching sessions attended. The logbook entries must be done in real time. The logbook is thus a record of various activities by the student like: (1) Overall participation & performance, (2) attendance, (3) participation in sessions, (4) record of completion of pre-determined activities, and (5) acquisition of selected competencies.

- The purpose of the Log book is to:
  a) help maintain a record of the work done during training,
  b) enable Faculty/Consultants to have direct information about the work done and intervene, if necessary,
  c) provide feedback and assess the progress of learning with experience gained periodically.

The Logbook should be used in the internal assessment of the student, should be checked and assessed periodically by the faculty members imparting the training. The PG students will be required to produce completed logbook in original at the time of final practical examination. It should be signed by the Head of the Department. A proficiency certificate from the Head of Department regarding the clinical competence and skillful performance of procedures by the student will be submitted by the PG student at the time of the examination.

The PG students shall be trained to reflect and record their reflections in logbook particularly of the critical incidents. Components of good teaching practices must be assessed in all academic activity conducted by the PG student and at least two sessions dedicated for assessment of teaching skills must be conducted every year of the PG program. The teaching faculty are referred to the MCI Logbook Guidelines uploaded on the Website.

K. **Course in Research Methodology**: All postgraduate students shall complete an NMC recognized course in Research Methodology within six months of the commencement of the batch and generate the online certificate on successful completion of the course.

Other aspects

- The Postgraduate trainees must participate in the teaching and training program of undergraduate students and interns attending the department.
- Trainees shall attend accredited scientific meetings (CME, symposia, and conferences) at least once a year.
- Department shall encourage e-learning activities.
- The Postgraduate trainees should undergo training in Basic Cardiac Life Support (BCLS), Neonatal Resuscitation, Advanced Pediatric Life Support and Adult Advanced Cardiac Life Support (ACLS).
- The Postgraduate trainees must undergo training in information technology and use of computers.

During the training program, patient safety is of paramount importance; therefore, relevant clinical skills are to be learnt initially on the models, later to be performed under supervision followed by independent performance. For this purpose, provision of skills laboratories in medical colleges is mandatory.

5. ASSESSMENT

FORMATIVE ASSESSMENT ie., assessment to improve learning

Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self-directed learning and ability to practice in the system.

General Principles

Internal Assessment should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills.

The Internal Assessment should be conducted in theory and practical/clinical examination, should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills.

Quarterly assessment during the MD training should be based on:

- Case presentation, case work up, case handling/management : once a week
- Laboratory performance : twice a week
- Journal club : once a week
- Seminar : once a fortnight
- Case discussions : once a fortnight/month
- Interdepartmental case or seminar : once a month

Note: These sessions may be organized and recorded as an institutional activity for all postgraduates.

- Attendance at Scientific meetings, CME programmes (at least 02 each)

For Knowledge Assessments, *Patient case scenario presentations and discussions including interdepartmental sessions remain the cornerstone of Paediatric learning focused on critical thinking and clinical reasoning. This is also ideally achieved during teaching at the bedsides on rounds and in ambulatory settings such as outpatient clinics if not emergency. Clinical Pathologic Case discussions, Mortality-Morbidity discussions and Prescription-Medication Order Audits are of great value and are encouraged to improve quality of care as well teaching-learning preferably scheduled every month to routine educational program.*

For Psychomotor and Affective/Communication Assessments*, consider the use of OSCEs, DOPs and even mini-CEX that one may strengthen Formative Feedback/Assessments.*

The student to be assessed periodically as per categories listed in appropriate (non-clinical/clinical) postgraduate student appraisal form (Annexure I).

SUMMATIVE ASSESSMENT ie., assessment at the end of training

Essential pre-requisites for appearing for examination include:

1. **Log book** of work done during the training period including rotation postings, departmental presentations, and internal assessment reports should be submitted.

2. At least one if not two presentation(s) at national/state level conference. If not presented at national level, alternatively, one research paper should be published / accepted in an indexed journal**.** (It is suggested that the local or University Review committee assess the work sent for publication).

The summative examination would be carried out as per the Rules given in the latest POSTGRADUATE MEDICAL EDUCATION REGULATIONS. The theory examination shall be held in advance before the Clinical and Practical examination, so that the answer books can be assessed and evaluated before the commencement of the clinical/Practical and Oral examination**.**

The postgraduate examination shall be in three parts:

1. **Thesis**

   Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination. The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination. A post graduate student in broad specialty shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners**.**

2. **Theory examination**

   The examinations shall be organized based on 'Grading' or 'Marking system' to evaluate and to certify post graduate student's level of knowledge, skill and competence at the end of the training, as given in the latest POSTGRADUATE MEDICAL EDUCATION REGULATIONS. Obtaining a minimum of 50% marks in 'Theory' as well as 'Practical' separately shall be mandatory for passing examination. The examination for M.D./ M.S shall be held at the end of 3rd academic year.

   There shall be 4 theory papers (as per PG Regulations).

   Paper I: Basic Sciences as related to the subject

Paper II: General Paediatrics

Paper III: Systemic Paediatrics

Paper IV: Recent Advances

3. Practical/clinical and Oral/viva voce examination

Practical examination

Practical examination should be as per concerned university regulation.

Oral/Viva voce examination shall be comprehensive enough to test the post graduate student's overall knowledge of the subject focusing on psychomotor and affective domain.

The final clinical examination in broad specialty clinical subjects should include:

- Cases pertaining to major systems (eg. one long case and three short cases)
- OSCE Stations to cover clinical, procedural and communication skills
- Logbook Records and reports of day-to-day observation during the training
- It is emphasized that Oral/viva voce examination shall be comprehensive enough to test the post graduate stu overall knowledge of the subject.

RECOMMENDED READING:

Books (latest edition)

1. Nelson Textbook of Pediatrics, Ed: Kliegman RM, St. Geme J. Elsevier.
2. PG Textbook of Pediatrics, Ed: Gupta P, Menon PSN, Ramji S, Lodha R. Jaypee
3. Rudolph's Pediatrics, Ed: Kline MW, McGraw Hill.
4. Textbook of Clinical Neonatology (IAP/NNF), Ed: Pejavar RK, Thakre R. Paras.
5. Cloherty and Stark's Manual of Neonatal Care. Ed: Eichenwald EC, Hansen AR, Martin CR, Stark AR. Wolters Kluwer.
6. Principles of Pediatric& Neonatal Emergencies (IAP). Ed: Gupta P, Bagga A, Ramji S, Chugh K, Lodha R, Dewan P, Kaushik JS, Shah D. Shah. Jaypee.
7. Clinical Methods in Pediatrics. Gupta P. CBS Publisher.
8. The Harriet Lane Handbook. Hughes HK, Kahl LK, Elsevier.
9. Nutrition and Child Development. Elizabeth KE. Paras Medical Publisher.
10. Illingworth's Development of The Infant and The Young Child. Au: Illingworth RS; Elsevier Health.

11. Fenichel's Clinical Pediatric Neurology. Au: Piña-Garza JE, James KC. Elsevier.
12. Park's Pediatric Cardiology for Practitioners. Myung Park M, Salamat M. Elsevier.
13. Lanzkowsky's Manual of Pediatric Hematology and Oncology. Fish J, Lipton J, Lanzkowsky P. Elsevier.
14. Essential Paediatric Pulmonology. Lodha R, Kabra SK. Jaypee.
15. Textbook of Pediatric Rheumatology. Petty RE, Laxer R, Lindsley C, Wedderburn L, Fuhlbrigge RC, Mellins ED. Elsevier.

Journals

03-05 international Journals and 02 national (all indexed) journals.

Online Resources

a. IAP https://www.iapindia.org/https://diapindia.org/
b. GOI MOHFW and IIPS. http://rchiips.org/nfhs/
c. Pubmed. https://pubmed.ncbi.nlm.nih.gov/
d. Google Scholar. https://scholar.google.co.in/
e. Cochrane. https://www.cochranelibrary.com/
f. Uptodate. https://www.uptodate.com/login
g. Clinical Key. https://www.clinicalkey.com/#!/login
h. Medscape. https://www.medscape.com/
i. JM Rey's IACAPAP e-Textbook of Child and Adolescent Mental Health. Rey JM, Martin A. International Association for Child and Adolescent Psychiatry and Allied Professions. ISBN 9780646574400 Free on https://iacapap.org/english/

Annexure I

Student appraisal form for MD in Pediatrics											
	Elements	**Less than Satisfactory**			**Satisfactory**			**More than satisfactory**			**Comments**
		1	2	3	4	5	6	7	8	9	
1	**Scholastic Aptitude and Learning**										
1.1	Has Knowledge appropriate for level of training										
1.2	Participation and contribution to learning activity (e.g., Journal Club, Seminars, CME etc)										
1.3	Conduct of research and other scholarly activity assigned (e.g. Posters, publications etc.)										
1.4	Documentation of acquisition of competence (eg Log book)										
1.5	Performance in work based assessments										
1.6	Self- directed Learning										
2	**Care of the patient**										
2.1	Ability to provide patient care appropriate to level of training										
2.2	Ability to work with other members of the health care team										
2.3	Ability to communicate appropriately and empathetically with patients families and care givers										
2.4	Ability to do procedures appropriate for the level of training and assigned role										
2.5	Ability to record and document work accurately and appropriate for level of										

	training										
2.6	Participation and contribution to health care quality improvement										
3	**Professional attributes**										
3.1	Responsibility and accountability										
3.2	Contribution to growth of learning of the team										
3.3	Conduct that is ethically appropriate and respectful at all times										
4	**Space for additional comments**										
5	**Disposition**										
	Has this assessment been discussed with the trainee?	Yes	No								
	If not explain										
	Name and Signature of the assesse										
	Name and Signature of the assessor										
	Date										

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NATIONAL MEDICAL COMMISSION

Postgraduate Medical Education Board

D 11011/1/22/AC/Guidelines/13 **Date: 05-08-2022**

GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR MD IN PHYSIOLOGY

GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR MD IN PHYSIOLOGY

Preamble

The purpose of postgraduate medical education in Physiology is to produce experts with necessary knowledge, skills and attitude to function as competent physiologists who actively contribute towards growth of the subject through research and intellectual contribution, participate in the training of budding health professionals, participate meaningfully in patient care and lifestyle disorders, stay abreast with the advancements in the field and serve the community at large. Physiology being the basis of entire practice of Medicine, a postgraduate in Physiology needs to acquire all necessary competencies that would enable him or her to function efficiently in domains of preclinical, para- clinical and clinical sciences.

The purpose of this document is to provide teachers and learners illustrative guidelines to achieve defined outcomes. The Expert group of the National Medical Commission has endeavored to render uniformity without compromise to purpose and content of this document. The revision within the document are mainly aimed to introduce competencies that ensure application of Physiology beyond preclinical boundaries and thereby improve health outcomes, embrace research and pedagogy as a vital part of training and reduce redundancy of contents. This document envisions a competent Physiologist who performs the roles of a Medical Teacher, Researcher, Member of Health Care Team (Clinical Physiologist), Administrator and Life Long learner with equal zeal and efficiency.

SUBJECT SPECIFIC LEARNING OBJECTIVES

Goal:

The goal is to have uniform standards in the teaching of Physiology at the postgraduate level throughout the country. The guidelines will help in achieving such standards which will ensure availability of competent physiologists equipped with required skills for teaching, patient care (diagnostic, therapeutic and rehabilitative) and applied research.

Learning Objectives

A postgraduate student having qualified for the MD (Physiology) examination should be able to:

1. Achieve comprehensive knowledge of general, systemic and applied Physiology.
2. Teach effectively the basic physiological mechanisms of human body in the context of pathophysiological basis of evolution, clinical presentation and management of disease states to undergraduate and postgraduate medical, dental and paramedical courses.
3. Acquire in-depth knowledge of physiology while catering to the learning needs of specific courses such as sports physiology, speech pathology etc.
4. Understand general principles of medical education (use of appropriate teaching techniques and resources) and apply theoretical frameworks in pedagogy.
5. Interpret and evaluate research publications critically.
6. Conduct research in core physiology, applied physiology and Education which may have significant application towards improving health, patient care and student learning.
7. Generate credible evidence towards advancement of Physiology and its application in basic and applied significance.
8. Acquire skills in conducting collaborative research in the field of physiology with allied sciences, clinical sciences and biomedical engineering.
9. Explain how the knowledge of physiology can be effectively applied in diagnostic and therapeutic clinical settings.
10. Integrate physiology with Diagnostic, Therapeutic, Preventive and Rehabilitative Medicine.
11. Interact with the allied departments and render services in advanced laboratory investigations.
12. Interact effectively with other paraclinical, clinical and allied health sciences departments to develop integrated modules in basic sciences and teach competencies related to the same.
13. Acquire administrative skills to set up concerned department / laboratories and initiate purchase procedures and procure necessary items for running such laboratories.

14. Be an efficient Leader and member of academic, research and health care team.
15. Participate actively in various workshops/seminars/journal clubs of allied subjects to acquire various skills for collaborative research.

SUBJECT SPECIFIC COMPETENCIES

At the end of the course, the postgraduate student should be able to:

A. Predominant in Cognitive Domain

1. Demonstrate in-depth understanding of basic physiological concepts, their clinical applications and physiological demands in special circumstances such as sports, environmental changes, yoga, meditation etc.
2. Demonstrate comprehensive knowledge of physiology of specific organ systems to cater to the learning needs of specialized courses such as speech pathology, kinesiology, aerospace physiology etc.
3. Impart knowledge about the basic physiological mechanisms of human body with reference to their implications in the pathophysiology of disease and the physiologic basis of their management to undergraduate medical and paramedical students.
4. Demonstrate knowledge of integrated study of basic sciences as per the needs of current CBME.
5. Demonstrate higher order thinking and problem-solving skills to exhibit interactive teaching techniques and facilitate contextual study of physiology in various teaching learning sessions.
6. Demonstrate knowledge and ability to participate in the present student centric TL strategies of CBME such as ECE, SDL, AETCOM and AITo (Aligned and Integrated Topic).
7. Demonstrate knowledge of the current assessment practices in undergraduate CBME such as DOAP.
8. Demonstrate knowledge of research methodologies and statistics.
9. Conduct such clinical and experimental research, as would have a significant bearing on human health and patient care.
10. Incubate ideas and contribute towards generation of patents and copyrights related to the subject.

11. Interact with other departments by rendering services in advanced laboratory investigations and relevant expert opinion.
12. Participate actively in various workshops/seminars/journal clubs/demonstration in the allied departments, to acquire various skills for collaborative research.
13. Contribute to society by imparting physiological understanding of health problems. Disseminate knowledge of human physiology, the clinical applications and research as per the needs or specific demands of the society at large.
14. Outline the components of a basic physiology curriculum, demonstrate ability to develop or implement the same in future academic career.
15. Serve as interface with society at large.

B Predominant in Affective domain

At the end of the course, the postgraduate student should be able to:

1. Demonstrate responsibility, professionalism and ethical conduct in all professional undertakings.
2. Demonstrate ethical conduct in biomedical or animal research.
3. Follow ethical guidelines with regards to research and publications.
4. Demonstrate appropriate behavior of not letting his/her personal beliefs, prejudices and limitations come in the way of duty.
5. Display principles of integrity and social accountability as a teacher.
6. Appreciate the issues of equity and social accountability while exposing students to early clinical exposure (Equity and social accountability).
7. Mentor/ counsel students to facilitate their holistic development.
8. Communicate effectively with peers, students and teachers in various curricular [teaching-learning, research] activities.
9. Function effectively as a member of the department, professional bodies and maintain professional conduct in interactions with students, peers, patient and staff.
10. Demonstrate the ability to give effective student feedback to undergraduate students.
11. Demonstrate the ability to receive feedback from teachers and peers.

12. Develop the capacity to reflect on own academic progress, develop self-directed learning skills and assess own learning needs.

C. Predominant in Psychomotor Domain

The postgraduate student should acquire practical competencies in the following tasks:

At the end of the course the postgraduate student should be able to:

1. Demonstrate physiological concepts of various organ systems by performing amphibian experiments using simulated models.
2. Demonstrate physiological concepts of specific organ systems by performing mammalian experiments using simulated models.
3. Perform and interpret a complete hematological profile.
4. Perform clinical examination of various organ systems.
5. Perform human experiments pertaining to specific organ systems and interpret results of the same.
6. Perform human experiments related to physiological challenges such as exercise, yoga and meditation.
7. Perform studies in stimulated environment - microgravity; high altitude; hot and cold environment.

Syllabus

Course contents:

A: Cognitive domain

Paper-I: ***General and Cellular Physiology including Genetic Basis and Historical perspectives:***

1. Physiology of cell, various cellular mechanisms and genetic control mechanisms.
2. Various principles of Physics and Physical Chemistry involved in physiological phenomenon e.g. haemo-dynamics, bio-electrical potentials, body fluids, methods of measurements.
3. History of Physiology, Noebl laurates and discoveries.
4. Biostatistics, Biophysics, Biochemistry, Micro-anatomy.
5. Growth and Development including aging.

6. Excretion, pH, water and electrolyte balance.
7. Comparative Animal Physiology

Paper-II: ***Systemic Physiology (system providing transport, nutrition and energy) including comparative Physiology.***

1. Blood and Immunity.
2. Cardiovascular System.
3. Respiratory System.
4. Gastro- Intestinal Tract (GIT) and dietary requirements.

Paper-III: ***Systemic Physiology (system concerned with procreation, regulation and neural control)***

1. Nerve-Muscle Physiology including muscle mechanics
2. Endocrine Physiology
3. Nervous System (Central, peripheral and autonomic)
4. Special Senses
5. Reproduction & family planning/fetal & neonatal Physiology

Paper-IV: ***Applied Physiology including recent advances***

1. Recent advances relevant to Physiology
2. Patho-physiology pertaining to systemic Physiology
3. Physiological basis of various clinical investigation tests
4. Interaction of human body in ambient environment- high altitude, space and deep sea
5. Exercise & Sports physiology
6. Transgender Physiology
7. Integrated Physiology
8. Yoga and Meditation
9. Social responsibilities of physiologists
10. Application of Artificial Intelligence in Physiology

B: Psychomotor domain:

A. The postgraduate student during the training period must PERFORM independently the following procedures:

i. Hematological profile

1. Estimation of hemoglobin
2. Determination of Total Erythrocyte (RBC) Count and RBC Indices (Blood Standards)
3. Determination of Total Leucocytes (WBC) Count : TLC
4. Preparation of a peripheral Blood Smear and Determination of Differential Leucocyte Count: DLC
5. Determination of Arneth Count
6. Determination of Bleeding Time (BT) and Clotting Time (CT)
7. Determination of Blood groups (A, B,O and Rh system)
8. Determination of Erythrocyte Sedimentation Rate (ESR) and Packed cell volume (PCV)
9. Determination of Osmotic Fragility of Red Blood Cells
10. Determination of Platelet Count
11. Determination of Reticulocyte Count

ii. Human Physiology

a. Clinical Physiology

1. Detailed clinical examination of various systems.

b. **Nerve muscle physiology**

1. Ergography and hand grip spring dynamography and study of human fatigue.
2. Recording of electromyography (EMG) and its application.
3. Recording of nerve conduction.

c. Cardiovascular system (CVS)

1. Clinical examination of CVS
2. Examination of arterial & venous pulses
3. Measurements of arterial blood pressure and effect of head-up/head-down tilt
4. Recording of 12 lead Electrocardiography (ECG) and its interpretation
5. Measurement of blood flow

6. Heart rate variability
7. Ambulatory Blood pressure monitoring

d. Respiratory system

1. Clinical examination of respiratory system.
2. Stethography – study of respiratory movements and effect of various factors.
3. Assessment of respiratory functions (spirometry, vitalography, and gas analysis).
5. Measurement of BMR.
6. Cardio pulmonary resuscitation (CPR) and Artificial respiration.

e. Gastrointestinal system:

1. Clinical examination of abdomen.

f. Integrative Physiology / Excretory system

1. Recording of body temperature/effect of exposure to cold and hot environment

g. Reproductive system

1. Determination of ovulation time by basal body temperature chart and pregnancy diagnostic test - Immunological Tests.
2. Semen analysis: sperm count, motility and sperm morphology.

h. Nervous System including Special senses

1. Clinical examination of the nervous system and its physiological basis.
2. Examination of higher mental functions.
3. Examination of cranial nerves.
4. Examination of sensory system.
5. Examination of motor system including reflexes.
6. Clinical examination of special senses:
    (i) Smell and Taste
    (ii) Test for hearing to differentiate deafness
    (iii) Physiology of eye:
        (a) Clinical examination of the eye and pupillary reflex
        (b) Visual acuity
        (c) Perimetery – mapping out of visual field and blind spot
        (d) Accommodation
        (e) Fundoscopy
        (f) Colour vision and colour blindness
7. Reaction (visual and auditory) and reflex time.

8. Electroencephalography (EEG) and Polysomnography
9. Autonomic Nervous System (ANS) Testing.
10. **Neuro-electrodiagnostic techniques:** Nerve conduction study, Visual evoked potential (VEP), Brainstem auditory evoked potential (B.A.E.P), Somato-sensory evoked potential (SEP), Motor evoked potential (MEP).
11. Use of various test batteries for psychological evaluation of subject.

i. Sports Physiology

Tests for physical fitness: Cardio – respiratory responses to steady state exercise using:

(i) Body Composition
(ii) Conducting the Clinical Exercise Test
(iii) Harvard step test
(iv) Bicycle Ergometry
(v) Treadmill test for determination of VO_2 max

j. Yoga and Meditation Physiology

i. Physical, Mental and Emotional well being
ii. Effect of yoga and pranayama on physiological parameters
iii. Mindfulness
iv. Concentration, anxiety and stress
v. Counseling in health and diseases

k. Others

1. Construction of dietary chart for growing children, pregnant woman, elderly individuals, hypertensive patients, & diabetes mellitus patients.
2. Basic Life Support and Cardiac Life Support
3. Effective Digital presentation, medical photography, Good Clinical Practice, Humanities and Bioethics.

iii. Amphibian (Frog) Experiments

All animal experiments must be compliant with Govenment of India Regulations, notified from time to time). Experiments in Amphibian/Dog/Cat should be conducted by computer assisted simulation models/ facilities. Other experiments should be performed as permissible by CPCSEA guidelines.

1. Effect of temperature on simple muscle twitch.
2. Effect of two successive stimuli (of same strength) on skeletal muscle.
3. Effect of increasing strength of stimuli on skeletal muscle.
4. Effect of increasing frequency of stimuli on skeletal muscle (genesis of tetanus).
5. Effect of free load and after load on skeletal muscle.
6. Effect of repeated stimuli on skeletal muscle (study of phenomenon of Fatigue).
7. Study of isometric contraction in skeletal muscle.
8. Determination of conduction velocity of sciatic nerve and effect of variables on it.
9. Properties of cardiac muscle – Refractory period, All-or-None Law, extra-systole and compensatory pause, beneficial effect.
10. Regulation of Heart, Vagus dissection and effect of Vagal and WCL stimulation.
11. Effect of physiological and pharmacological variables on intact frog's heart.
12. Perfusion of isolated frog's heart-role of sodium, potassium, calcium ions and drugs.

B. **The postgraduate student during the training period must ASSIST in the following procedures:**

Human Physiology

i. **Cardiovascular system (CVS)**

- Cardiac TMT Holter Monitoring
- Collection and Assessment of Arterial blood gas

ii. Nervous System including Special senses

- Intra operative neuro monitoring (IONM)

C. The postgraduate student during the training period must OBSERVE the following procedures:

i. Hematological profile

- Determination of Absolute Eosinophil Count
- Study of Haemopoietic Cells present in the Bone Marrow

- Other high end hematological investigations (specify): Flow cytometry, Platelet functions, D Dimers, coagulation profile etc.

ii. Human Physiology

- **Cardiovascular system (CVS)**
  - Echocardiography
  - Central venous line insertion, CVP monitoring
- **Respiratory system**
  - Introduction to working of continuous positive airway pressure and Bilevel positive airway pressure (CPAP & BiPAP) Therapy
    - Ventilator setting
- **Gastrointestinal system:**
  - GI Manometry
- **Reproductive system**
  - Ovulation study by using ultrasonography
- **Integrative Physiology / Excretory system**
  - Pressure and PH studies in esophagus, stomach, intestine and rectum
- **Others**
  - Genetic testing and introduction to procedural skills for clinical genetics/ prenatal diagnosis/ adult genetics - birth defects, genetic hematology, dysmorphology, skeletal dysplasia, neurological and muscular disorders, primary immunodeficiency diseases, autoimmune and multi-factorial disorders, biology and genetics of cancer.
  - Interaction of human body in ambient environment - high altitude, space and deep sea
  - Exercise & Sports physiology
  - Integrated Physiology
  - Yoga and Meditation
  - Social responsibilities of physiologists
  - Application of Artificial Intelligence in Physiology

iii. Mammalian Experiments (Dog/Rabbit/Guinea pig/Rat/Mice)

- General management of mammalian experiments.

- Recording of heart rate, blood pressure and respiration and study the effects of various factors; drugs; asphyxia; occlusion of common carotid artery.
- Effect of stimulation of central and peripheral end of vagus on arterial blood pressure and respiration after vagotomy.
- Effect of stimulation and distension of carotid sinus on blood pressure and respiration.
- Effect of stimulation of splanchnic nerve.
- Effect of stimulation of peripheral somatic nerve (sciatic nerve).
- Study of hypovolemic shock and its reversal.
- Perfusion of isolated mammalian heart and study the effects of drugs and ions.
- Recording of Isolated Intestinal movement and tone and studying the effect of drugs and ions.
- Study of various stages of menstrual cycle, cervical smear and vaginal smear.

Departmental resources

It is to be mandatory for the department to establish and develop the following laboratories. In addition to teaching, these laboratories should be involved in active research and in patient care services in one or more well defined fields.

1. Clinical Neurophysiology Laboratory

The department should generate liaison with clinical department and provide routine services for health monitoring and diagnostics (disease).

(i) Electroencephalography
(ii) Evoked potential recording
(iii) Electromyography
(iv) Nerve conduction studies
(v) Autonomic nervous system (ANS) testing
(vi) Any other newer technology like Functional Near infrared spectroscopy (fNIRS), Intra operative neuro monitoring (IONM), polysomnography
(vii) Diabetic neuropathy assessment kit

(viii) Reaction time apparatus

(ix) Electroretinography

2. Cardio-Respiratory Laboratory

The department should generate liaison with clinical department and provide routine services for health monitoring and diagnostics (disease).

(i) Electrocardiography

(ii) Blood-gas Analysis

(iii) Computerized multifunctional spirometry

(iv) Laboratory for measuring pulmonary diffusion capacity and functional residual capacity (FRC)

(v) Whole-body plethysmography

(vi) Laboratory for Blood flow measurements (Impedance plethysmograph/Laser flow meter/ Doppler flow meter)

(vii) Ankle brachial pressure index/ Vascular Doppler

3. Exercise Physiology Laboratory

The department should generate liaison with sports authorities and clinical departments to provide services for testing and grading exercise and physical efficiency for health monitoring and diagnostics (disease). This should be done by using the following techniques:

(i) Two step test exerciser

(ii) Bicycle Ergometry

(iii) Tread mill

(iv) Respiratory gas analysis and measurement of basal metabolic rate (BMR)

4. Metabolic/Endocrinology/Reproductive Bio-medicine laboratory

This laboratory should perform various tests pertaining to gastrointestinal, renal, metabolic, endocrinal and reproductive bio-medicine. The department should generate liaison with clinical departments and provide routine services for health monitoring and diagnostics (disease).

1. Body Fat Analysis
2. Spectrophotometer
3. pH meter
4. Elisa Reader/Washer

5. Luminometer
6. Semi-autoanalyzer
7. Artificial reproductive techniques/ semen laboratory/ infertility laboratory

Post graduate students should be posted in the above laboratories and extend the required services on routine basis.

The Department should be equipped with general facilities like PG resource room with internet access and a departmental library with books especially those related to pertinent higher studies in Physiology and field of research. The college/department should make important journals available (at least four Indian journals and two international journals – Online/Offline).

TEACHING AND LEARNING METHODS

General principles

Acquisition of competencies being the keystone of doctoral medical education, such training should be skills oriented. Learning in the program, essentially autonomous and self-directed, and emanating from academic and clinical work, shall also include assisted learning. The formal sessions are meant to supplement this core effort.

All students joining the postgraduate (PG) courses shall work as full-time (junior) residents during the period of training, attending not less than 80% of the training activity during the calendar year, and participating in all assignments and facets of the educational process. They shall maintain a log book for recording the training they have undergone, and details of the procedures done during laboratory and clinical postings in real time.

Teaching-Learning methods

This should include a judicious mix of demonstrations, symposia, journal clubs, clinical meetings, seminars, small group discussion, bed-side teaching, case-based learning, simulation-based teaching, self-directed learning, integrated learning, interdepartmental meetings and any other collaborative activity with the allied departments. Methods with exposure to the applied aspects of the subject relevant to

basic/clinical sciences should also be used. **The suggested examples of teaching-learning methods are given below but are not limited to these. The frequency of various below mentioned teaching-learning methods can vary based on the subject's requirements, competencies, work load and overall working schedule in the concerned subject.**

A. Lectures: Didactic lectures should be used sparingly. A minimum of 10 lectures per year in the concerned PG department is suggested. Topics to be selected as per subject requirements All postgraduate trainees will be required to attend these lectures. Lectures can cover topics such as:

1. Subject related important topics as per specialty requirement
2. Recent advances
3. Research methodology and biostatistics
4. **Salient features of** Undergraduate/Postgraduate medical curriculum
5. Teaching and assessment methodology.

Topic numbers 3, 4, 5 can be done during research methodology/biostatistics and medical education workshops in the institute.

B. Journal club: Minimum of once in 1-2 weeks is suggested.

Topics will include presentation and critical appraisal of original research papers published in peer reviewed indexed journals. The presenter(s) shall be assessed by faculty and grades recorded in the logbook.

C. Student Seminar: Minimum of once every 1-2 weeks is suggested.

Important topics should be selected as per subject requirements and allotted for in-depth study by a postgraduate student. A teacher should be allocated for each seminar as faculty moderator to help the student prepare the topic well. It should aim at comprehensive evidence-based review of the topic. The student should be graded by the faculty and peers.

D. Student Symposium: Minimum of once every 3 months.

A broad topic of significance should be selected, and each part shall be dealt by one postgraduate student. A teacher moderator should be allocated for each symposium and moderator should track the growth of students. The symposium should aim at an evidence-based exhaustive review of the topic. All participating postgraduates should be graded by the faculty and peers.

E. Laboratory work / Bedside clinics: Minimum - once every 1-2 weeks.

Laboratory work/Clinics/bedside teaching should be coordinated and guided by faculty from the department. Various methods like DOAP (Demonstrate, Observe, Assist, Perform), simulations in skill lab, and case-based discussions etc. are to be used. Faculty from the department should participate in moderating the teaching-learning sessions during clinical rounds.

F. Interdepartmental colloquium

Faculty and students must attend monthly meetings between the main Department and other department/s on topics of current/common interest or clinical cases.

G. a. Rotational clinical / community / institutional postings

- Depending on local institutional policy and the subject specialty needs, postgraduate trainees may be posted in relevant departments/ units/ institutions including Medical Education Unit (MEU) or Department of Medical Education (DOME). The aim would be to acquire more in-depth knowledge as applicable to the concerned specialty. Postings would be rotated between various units/departments and details to be included in the specialty-based Guidelines.
- **Clinical Postings:** Compulsory clinical postings in following departments must be undertaken as per specified number of days in table 1 depicted below:

Table 1: Plan of Clinical postings for MD Physiology

Prof Year	Department	Period of posting	Focus areas
1st year	Biochemistry	15 days	1. Auto & Semi auto Analyzer, Electrophoresis, Chromatography, RIA, Study of serum chemistry (proteins, Lipid, glucose, electrolytes, enzymes etc.) – 8 days 2. Constituents of normal and abnormal urine, liver function tests, Renal function tests, Gastric function tests – 7 days
I st year	Pharmacology	20 days	1. Animal House (to learn technique of Animal Handling, Blood sampling, anesthesia, Euthanasia, effective Analgesia and infection control after

			surgery. Study of Animal behavior like eating, drinking, locomotion, sexual activity etc.) 2. Experimental Pharmacology lab to study ongoing animal experimental procedures including dissection for rat phrenic nerve hemidiaphragm and others – 10 days 2. Study various guidelines related to ethical use of animals in experiments. To study preparation of different animal models and various tests to study physiological parameters. – 15 days
I st year	Pathology	30 days	1. Blood bank - Cross matching, blood Storage, Immunohistochemistry, Immunological tests – 15 days 2. Central Lab. - Tests for bleeding & clotting disorders, study of Haemopoietic Cells present in the Bone Marrow – 10 days 3. Semen analysis, determination of ovulation time by basal body temperature chart and pregnancy diagnostic tests – 5 days
I st year	Microbiology	10 days	1. Fluorescent microscopy, use of Elisa reader & Washer – 5 days 2. Immuno-physiology and other facilities available in the dept. – 5 days
IInd year	Ophthalmology	15 days	1. Direct and indirect Ophthalmoscopy, Retinoscopy – 8 days 2. Slit lamp microscopy, Tonometry, Pachymetry, Study of corneal topology, Optometry, Auto-refractometer – 7 days
IInd year	Tuberculosis & Chest Disease (Pulmonary Medicine)	15 days	1. Whole body plethysmography – 8 days 2. Bronchoscopy & other facilities available in the dept. – 7 days
IInd year	ENT	15 days	1. Audiometry – 7 days

			2. Oto-rhino-laryngoscopy, direct and Indirect Laryngoscopy, BERA, BSAEP – 8 days
IIIrd year	General Medicine	20 days	1. TMT, Holter analysis, ABG, ECG – 10 days 2. EMG, NCV – 10 days
IIIrd year	Psychiatry	10 days	1. EEG 2. Biofeedback
IIIrd year	Casualty	15 Days	1. To know basics of how to handle emergency 2. Minor procedures

Every posting should have its defined learning objectives. It is recommended that the departments draw up objectives and guidelines for every posting offered in conjunction with the collaborating department/s or unit/s. This will ensure that students acquire expected competencies and are not considered as an additional helping hand for the department / unit in which they are posted. The PG student must be tagged along with those of other relevant departments for bedside case discussion/basic science exercises as needed, under the guidance of an assigned faculty.

G b. Posting under "District Residency Programme" (DRP):

All postgraduate students pursuing MD/MS in broad specialities in all Medical Colleges/Institutions shall undergo a compulsory rotation of three months in District Hospitals/District Health System as a part of the course curriculum, as per the Postgraduate Medical Education (Amendment) Regulations (2020). Such rotation shall take place in the 3rd or 4th or 5th semester of the postgraduate programme and the rotation shall be termed as "District Residency Programme" and the PG medical student undergoing training shall be termed as "District Resident".

Opportunities to present and discuss infectious disease cases through bedside discussion and ward/grand rounds with specialists / clinicians in different hospital settings must be scheduled to address antimicrobial resistance issues and strategies to deal with it.

I. Teaching research skills

Writing a thesis should be used for inculcating research knowledge and skills. All postgraduate students shall conduct a research project of sufficient depth to be presented to the University as a postgraduate thesis under the supervision of an eligible faculty member of the department as guide and one or more co-guides who may be from the same or other departments.

In addition to the thesis project, every postgraduate trainee shall participate in at least one additional research project that may be started or already ongoing in the department. It is preferable that this project will be in an area different from the thesis work. For instance, if a clinical research project is taken up as thesis work, the additional project may deal with community/field/laboratory work. Diversity of knowledge and skills can thereby be reinforced.

J. Training in teaching skills

MEU/DOME should train PG students in education methodologies and assessment techniques. The PG students shall conduct UG classes in various courses and a faculty shall observe and provide feedback on the teaching skills of the student.

K. Log book

During the training period, the postgraduate student should maintain a Log Book indicating the duration of the postings/work done in Wards, OPDs, Casualty and other areas of posting (as specified in table 1) . This should indicate the procedures assisted and performed and the teaching sessions attended. The log book entries must be done in real time. The log book is thus a record of various activities by the student like: (1) Overall participation & performance, (2) attendance, (3) participation in sessions, (4) record of completion of pre-determined activities, and (5) acquisition of selected competencies.

The purpose of the Log Book is to:

a) help maintain a record of the work done during training,
b) enable Faculty/Consultants to have direct information about the work done and intervene, if necessary,
c) provide feedback and assess the progress of learning with experience gained periodically.

The Log Book should be used in the internal assessment of the student, should be checked and assessed periodically by the faculty members imparting the training. The PG students will be required to produce completed log book in original at the time of final practical examination. It should be signed by the Head of the Department. A proficiency certificate from the Head of Department regarding the clinical competence and skillful performance of procedures by the student will be submitted by the PG student at the time of the examination.

The PG students shall be trained to reflect and record their reflections in log book particularly of the critical incidents. Components of good teaching practices must be assessed in all academic activity conducted by the PG student and at least two sessions dedicated for assessment of teaching skills must be conducted every year of the PG program. The teaching faculty are referred to the MCI Logbook Guidelines uploaded on the Website.

L. **Course in Research Methodology**: All postgraduate students shall complete an online course in Research Methodology within six months of the commencement of the batch and generate the online certificate on successful completion of the course.

Other aspects

- The postgraduate trainees must participate in the teaching and training program of undergraduate students and interns attending the department.
- Trainees shall attend accredited scientific meetings (CME, symposia, and conferences) at least once a year.
- Department shall encourage e-learning activities.
- The postgraduate trainees should undergo training in Basic Cardiac Life Support (BCLS) and Advanced Cardiac Life Support (ACLS).
- The postgraduate trainees must undergo training in information technology and use of computers.

During the training program, patient safety is of paramount importance; therefore, relevant clinical skills are to be learnt initially on the models, later to be performed under supervision followed by independent performance. For this purpose, provision of skills laboratories in medical colleges is mandatory.

ASSESSMENT

FORMATIVE ASSESSMENT, i.e. assessment to improve learning

Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self-directed learning and ability to practice in the system.

General Principles

Internal Assessment should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills.

The Internal Assessment should be conducted in theory and practical/clinical examination, should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills.

Quarterly assessment during the MD training should be based on:

- Case presentation, case work up, case handling/management : once a week
- Laboratory performance : twice a week
- Journal club : once a week
- Seminar : once a fortnight
- Case discussions : once a fortnight/month
- Interdepartmental case or seminar : once a month

Note: These sessions may be organized and recorded as an institutional activity for all postgraduates.

- Attendance at Scientific meetings, CME programs (at least 02 each)

The student to be assessed periodically as per categories listed in appropriate (non-clinical/clinical) postgraduate student appraisal form (Annexure I).

SUMMATIVE ASSESSMENT, ie., assessment at the end of training

Essential pre-requisites for appearing for examination include:

1. **Log book** of work done during the training period including rotation postings, departmental presentations, and internal assessment reports should be submitted.

2. At least **two presentations** at national level conference. One research paper should be published / accepted in an indexed journal**. (It is suggested that the local or University Review committee assess the work sent for publication).**

The summative examination would be carried out as per the Rules given in the latest POSTGRADUATE MEDICAL EDUCATION REGULATIONS. The theory examination shall be held in advance before the Clinical and Practical examination, so that the answer books can be assessed and evaluated before the commencement of the clinical/Practical and Oral examination**.**

The postgraduate examination shall be in three parts**:**

1. **Thesis**

   Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination. The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination. A postgraduate student in broad specialty shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners**.**

2. **Theory examination**

   The examinations shall be organized on the basis of 'Grading' or 'Marking system' to evaluate and to certify postgraduate student's level of knowledge, skill and competence at the end of the training, as given in the latest POSTGRADUATE MEDICAL EDUCATION REGULATIONS. Obtaining a minimum of 50% marks in 'Theory' as well as 'Practical' separately shall be mandatory for passing examination as a whole. The examination for M.D./ M.S shall be held at the end of 3rd academic year.

   There shall be four theory papers (as per PG Regulations).

   Paper I: Basic sciences as applied to the subject (General and Cellular Physiology including Genetic basis and historical perspectives)

Paper II: Systemic Physiology (system providing transport, nutrition and energy) including comparative Physiology

Paper III: Systemic Physiology (system concerned with regulation, neural control and procreation)

Paper IV: Recent advances in the subject (including applied Physiology)

3. Practical/clinical and Oral/viva voce examination

Practical examination

Practical examination should be spread over **two** days and include various major components of the syllabus focusing mainly on the psychomotor domain.

Oral/Viva voce examination on defined areas should be conducted by each examiner separately. Oral examination shall be comprehensive enough to test the postgraduate student's overall knowledge of the subject focusing on psychomotor and affective domain.

The practical examination should include:

- Case presentation pertaining to major systems
- Stations for clinical, procedural and communication skills
- Log Book Records and reports of day-to-day observation during the training
- It is emphasized that Oral/viva voce examination shall be comprehensive enough to test the postgraduate student's overall knowledge of the subject

Recommended Reading:

Books (latest edition)

1. A.C. Guyton – Text book of Medical Physiology
2. W.F. Ganong – Review of Medical Physiology
3. William's Textbook of Endocrinology
4. J.E. Cotes- Respiratory Physiology
5. D.T. Harris – Experimental Physiology
6. Wintrobe's – Clinical Hematology
7. **P**rinciples of medical physiology by Sircar
8. Brown B.L. – Cell signaling, Biology and medicine of signal transudation
9. Berne and Levy- Medical Physiology

10. Textbook of Medicine by Harrison
11. Principles of Neural sciences edited by E. R. Kandel, J. H. schwartz and T. M. Jessell
12. Williams Hematology edi. by M.A. Lichtman, E. Beutter, K. Kaushansxy, T.J. Kipps, U. Seligsohn, J. Prachal
13. Medical Physiology: by W. F. Boron and E. L. Boulpep
14. Medicat Physiology: by A. Rhodes and G. A. Tanner
15. Neuroscience : by Dale Purves

Practical Books:

1. Hutchison's Clinical Methods: An Integrated Approach to Ctinical Practice.
2. Macleod’s clinical Examination
3. Textbook of Practical Physiology: by Dr. G. K. Pal and Dr. Pravati Pal
4. Textbook of Practical Physiology: by Dr. C. L. Ghai
5. Textbook of Practical Physiology: by Dr. Ranade
6. Textbook of Practical Physiology: by Dr. A. K. Jain

Journals:

03-05 International Journals and 02 National (all indexed) journals

Annexure 1

Student appraisal form for MD in Physiology

	Elements	Less than Satisfactory			Satisfactory			More than satisfactory			Comments
		1	2	3	4	5	6	7	8	9	
1	**Scholastic aptitude and learning**										
1.1	Has knowledge appropriate for level of training										
1.2	Participation and contribution to learning activity (e.g., Journal Club, Seminars, CME etc)										
1.3	Conduct of research and other scholarly activity assigned (e.g Posters, publications etc.)										
1.4	Documentation of acquisition of competence (eg Log book)										
1.5	Performance in work based assessments										
1.6	Self-directed Learning										
2	**Work related to training**										
2.1	Practical skills that are appropriate for the level of training										
2.2	Respect for processes and procedures in the work space										
2.3	Ability to work with other members of the team										
2.4	Participation and compliance with the quality improvement process at the work environment										
2.5	Ability to record and document work accurately and appropriate for level of training										

3	**Professional attributes**										
3.1	Responsibility and accountability										
3.2	Contribution to growth of learning of the team										
3.3	Conduct that is ethically appropriate and respectful at all times										
4	**Space for additional comments**										
5	**Disposition**										
	Has this assessment pattern been discussed with the trainee?	Yes	No								
	If not explain.										
	Name and Signature of the assesse										
	Name and Signature of the assessor										
	Date										

Subject Expert Group members for preparation of REVISED Guidelines for competency based postgraduate training programme for MD in Physiology

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Passed by Academic Council (Resolution No. 355/2006) dtd. 30/05/2006, subject to Uniformity in the Examination pattern.

OBJECTIVES OF CURRICULUM PLANNING

FOR PG DEGREE

OBJECTIVES

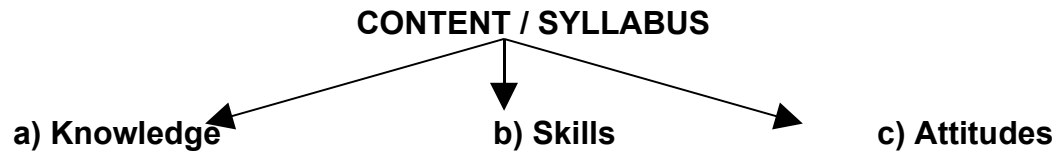
1) Therapeutic :
   a) To examine, diagnose and treat psychiatric disorders.
   b) Consultation – Liason psychiatry in general hospital.

2) Preventive and Promotive
   a) Prevention of relapses and complication of psychiatric disorders and addictive behaviour.
   b) Rehabitation of mentally ill patients.
   c) Promotion of mental health in the population in terms of improving mental well being & Quality of life.

3) To inculcate an empathic attitude that allows an integration of humanistic and Ethical approach in medicine.

4) To Apply Research Methodology in the field of psychiatry

5) To be aware of Knowledge of recent advance in psychiatry.



a) <u>KNOWLEDGE:</u>

1. BASIC SCIENCES AS APPLIED TO PSYCHIATRY

- NEUROANATOMY
  - Developmental
  - Central peripheral autonomic
  - Principles of Brain imaging

- NEUROPHYSIOLOGY
    - Normal sleep
    - Basic cell
    - Of thought ,cognition mood and Motor function
- NEUROCHEMISTRY
    - Neurotransmitters
    - In emotion, memory,behaviour
- Applied Neurophysiology., Neurochemistry., Neuroanatomy in relation to physical factors affecting psychiatric disorders.

PSYCHOLOGY

- Basic principles e.g. Learning, memory, motivation, emotion and stress etc.
- Applied psychology – behaviour science
- Sensory processes and perception
- Thinking and language
- Social perception, Influences and relationships
- Attitudes and beliefs
- Developmental psychology child development
- Personality structure
- Psychological assessment and testing (IQ and cognition)
- EEG
- Genetics

2. PSYCHIATRY, NEUROLOGY, NEUROPSYCHIATRY AND BEHAVIOURAL MEDICINE

PSYCHIATRY

- Introduction to mental health and psychiatric disorders
- History taking and clinical examination in psychiatry
- Classificatory systems.
- History of Psychiatry
- Schizophrenia and other psychotic disorders.
- Mood Disorders
- Anxiety and Somatoform and dissociative disorders
- Substance related disorders
- Sexual disorders
- Sleep disorders
- Eating disorders
- Psychiatric disorders due to General Medical Consumption including HIV
- Disaster and Psychiatry
- Special population in psychiatry
- Personality disorders
- Impulse control disorders
- Adjustment disorders
- Relational problems
- Psychiatric emergencies
- Deliberate self harm / Suicide

- Transcultural psychiatry
- Child and adolescent psychiatry
- Family psychiatry
- Geriatric psychiatry
- Community psychiatry in relation to India (NMHP)
- Forensic psychiatry (Mental Health Act)
- Ethics
- Human rights
- Rehabilitation.
- Psychosomatic disorders including stress
- Therapies
    a) Biological - ECT and Psychopharmacology
    b) Psychosocial interventions
    c) Psychotherapy
    d) Behaviour therapy
    e) Therapies based on Indian philosophy

NEUROLOGY, NEUROPSYCHIATRY

- Clinical history and CNS examination
- Head injuries
- Alcohol and substance
- Toxic & metabolic & endocrine Disorders
- Nutritional
- Dementias
- Delirium
- SOL

- Infections and inflammatory diseases including HIV
- Movement disorders
- Epilepsy
- CVA
- Investigations

MEDICINE AS RELATED TO PSYCHIATRY

Consultation liason psychiatry

Medicine and allied

Surgery and allied

Gynecology and Obstetrics and allied

b. **SKILLS**

- Communication skills
- History taking and interview
- Mental status evaluation & Physical Examination with neurological examination
- Diagnostic formulation and comprehensive plan of management
- Appraisal of Psychometry ie Intelligence , personality
- Handling emergencies and liaison services
- Psycho-education skills
- Ethical discharge of duties
- Tackling medico legal issues
- Psychotherapy and counseling
- Behavior Therapy
- Interpretation of EEG, C T, MRI
- Biological therapies including ECT & Psychopharmacology

c. ATTITUDES AND VALUES

- For professional and ethical conduct
- Humanistic and empathic relationship with patients, relatives and colleagues.

d. TEACHING LEARNING METHODS

Cognitive:

- Lectures
- Tutorials
- Seminars
- Symposium
- Didactic Small group teaching
- Workshop
- Self study
- Inter disciplinary conference
- Research forum

Skills:

- Demonstrations
- Case conference
- Research project
- Workshops
- Bedside clinics
- Journal review
- Psychotherapy and Behavior Therapy session

Attitude:

- Roll play
- Audio-visual
- Workshops
- Demonstration

EVALUTION: (*As per Direction No. 01/2008 dtd. 26/05/2008 & practical scheme is as per revised practical marksheet.)*

Dissertation /Thesis

- **Time spent should be one year**
- **Supervision**
- **Evaluation mandatory**

Log book of all the academic activities of students

- **Attitude:**
    - Structured evaluation and Scales
    - Group Discussion
    - Log Book
    - Clinical - patient relationship

RECOMMENDED BOOKS AND JOURNALS:

- Psychology - Morgan King
- Anatomy - Snelles
- Physiology – Guyton
- Symptoms in the mind – Sims
- Comprehensive Textbook of psychiatry – Kaplan
- Postgraduate psychiatry – Niraj Ahuja(Indian text book)
- Oxford Text book of Psychiatry
- Organic psychiatry – Lishmann
- Indian Journal of Psychiatry

NATIONAL MEDICAL COMMISSION
Postgraduate Medical Education Board

D 11011/1/22/AC/Guidelines/15 **Date: 05-08-2022**

GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR M.D. IN PSYCHIATRY

GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR MD IN PSYCHIATRTY

Preamble

The purpose of PG education is to create specialists who would provide high quality health care and advance the cause of science through research & training.

A postgraduate specialist having undergone the required training should be able to recognize the health needs of the community, should be competent to handle medical problems effectively and should be aware of the recent advances pertaining to his specialty. The post graduate student should acquire the basic skills in teaching of medical/para-medical students. She/he is also expected to know the principles of research methodology and modes of consulting library.

The purpose of this document is to provide teachers and learners illustrative guidelines to achieve defined outcomes through learning and assessment. This document was prepared by various subject-content specialists. The Reconciliation Board of the Academic Committee has attempted to render uniformity without compromise to purpose and content of the document. Compromise in purity of syntax has been made in order to preserve the purpose and content. This has necessitated retention of "domains of learning" under the heading "competencies".

SUBJECT SPECIFIC LEARNING OBJECTIVES

The primary **goal** of the MD course in Psychiatry is to produce a post graduate clinician able to provide health care in the field of Psychiatry. A physician qualified in Psychiatry, at the end of the course, should be able to diagnose and treat psychiatric disorders, take preventive and curative steps for the disease in the community at all levels of health care and qualify as a consultant and teacher in the subject.

At the end of the MD course in Psychiatry, the student should be able to:

- Understand the relevance of mental health in relation to the health needs of the country,
- Ethical considerations in the teaching and practice of Psychiatry,
- Identify the social, economic, biological and emotional determinants of mental health,
- Identify the environmental causes as determinants of mental health,
- institute appropriate diagnostic, therapeutic and rehabilitative procedures to the mentally ill patient,

- Take detailed history, conduct appropriate ethically valid physical examination and institute appropriate evaluation procedures to make a correct clinical diagnosis,
- Perform relevant investigative and therapeutic procedures for the psychiatric patient,
- Recommend appropriate laboratory and imaging examinations and interpret the results correctly,
- Plan and deliver comprehensive treatment of a psychiatric patient using principles of rational drug therapy,
- Plan rehabilitation of psychiatric patient suffering from chronic illness,
- Clinically manage psychiatric emergencies efficiently,
- Demonstrate empathy and humane approach towards patients and their families and respect their sensibilities,
- Demonstrate communication skills of a high order in explaining management and prognosis, providing counselling and giving health education messages to patients, families and communities,
- Develop appropriate skills to practice evidence-based psychiatry,
- Demonstrate competence in basic concepts of research methodology and epidemiology,
- Be aware of and take appropriate steps in the implementation of national mental health programs, effectively and responsibly,
- Be aware of the concept of essential drugs and rational use of drugs,
- Be aware of the legal issues in the practise of Psychiatry,
- Be aware of the special requirements in the practice of Child and adolescent Psychiatry and Geriatric Psychiatry.
- Be aware of the role of sex and gender in the practice of psychiatry
- Be able to determine the capacity and capability of the individual (especially children and adolescents) to identify and articulate a gender identity

- **Research:** The student should know the basic concepts of research methodology and plan a research project in accordance with ethical principles. S/he should also be able to interpret research findings and apply these in clinical practice. S/he should know how to access and utilize information resources and should have basic knowledge of statistics.
- **Teaching:** S/He should learn the basic methodology of teaching and develop competence in teaching medical/paramedical students, health professionals, members of allied disciplines (e.g. behavioural sciences), law enforcement agencies, families and consumers and members of the public.

SUBJECT SPECIFIC COMPETENCIES

By the end of the course, the student should have acquired knowledge (cognitive domain), professionalism (affective domain) and skills (psychomotor domain) as given below:

A. Cognitive domain

By the end of the course, the student should demonstrate knowledge in the following:

1. General topics:

1. The student should be able to demonstrate knowledge of basic sciences (Anatomy, Physiology, Biochemistry, Microbiology, Pathology and Pharmacology) as applied to Psychiatry.
2. The student should be able to explain aetiology, assessment, classification and management and prognosis of various psychiatric disorders (including psychiatric sub-specialities including Neuroanatomy, Neurophysiology, Neurochemistry, Neuroimaging, Electrophysiology, Psychoneuroendocrinology, Psychoneuroimmunology, Chronobiology and Neurogenetics.
3. Acquire knowledge of delirium, dementia, and amnestic and other cognitive disorders and mental disorders due to a general medical condition.
4. The student should be able to discuss long term care of persons with chronic mental health problems
5. The student should acquire knowledge of emergency measures in acute crisis arising out of various psychiatric illnesses including drug detoxification and withdrawal.
6. The student should acquire knowledge of pharmacokinetics & pharmacodynamics of drugs involved in psychiatric management of patients.
7. The student should acquire knowledge of (a) normal child development and adolescence (b) neurodevelopmental disorders, intellectual disability and specific learning disability and their management
8. The student should acquire knowledge and be able to explain mechanisms for rehabilitation of psychiatric patients.
9. The student should acquire knowledge of substance related disorders and their management.
10. The student should acquire knowledge of psychotic disorders, mood disorders, and anxiety disorders and their management
11. The student should understand difference between sex and gender/ biological and social construction of personhood; sexual/gender identity; transgender, gender non-conformity, and other gender diverse identities, sexual/sexuality identity, sexual orientation, sexual desire; the wide variety, and cultural presence of various sexual orientations and desires; gender dysphoria and its management.

12. The student should acquire knowledge of eating disorders and sleep disorders and their management
13. The student should be conversant with recent advances in Psychiatry.
14. The student should be conversant with routine bedside diagnostic and therapeutic procedures and acquire knowledge of latest diagnostics and therapeutics procedures available.
15. The student should be conversant with various policy related aspects of Psychiatric practice in India (e.g. Mental Health Act, National Health Mental Health Programmes etc.).
16. The student should be conversant with research methodologies.
17. Student should be conversant with the role of Yoga and Meditation in the management of psychiatric disorders.

B. Affective Domain:

1. The student should be able to function as a part of a multidisciplinary team, develop an attitude of cooperation with colleagues, and interact with the patient and the clinician or other colleagues to provide the best possible diagnosis or opinion.
2. The student should always adopt ethical principles and maintain proper etiquette in dealings with patients, relatives and other health personnel and to respect the rights of the patient including the right to information, confidentiality and second opinion.
3. The student should develop communication skills to prepare reports and professional opinion as well as to interact with patients, relatives, peers and paramedical staff, and for effective teaching.

C. Psychomotor domain

At the end of the course, the student should acquire the following clinical skills and be able to:

1. Obtain a proper relevant history and perform thorough clinical examination including detailed mental state examinations using proper communication skills.
2. Able to do risk assessment and mental capacity assessment.
2. Provide a clinical formulation, arrive at a logical working diagnosis and differential diagnosis after clinical examination.
3. Order appropriate investigations keeping in mind their relevance and cost effectiveness and obtain additional relevant information from family members to help in diagnosis and management.

4. Identify psychiatric situations calling for urgent or early intervention and refer at the optimum time to appropriate centres.
5. Write a complete case record with all necessary details.
6. Write a proper discharge summary with all relevant information.
7. Obtain informed consent for any examination/procedure.
8. Perform clinical audit.
9. Must be able to perform modified Electroconvulsive therapy (ECT).
10. Should have the following skills in relation to gender related issues:
    - Demonstrate the ability to assess the gender identity of an individual and distress caused (if any) due to the individual's own gender identity in simulated environment.
    - Describe and understand how to discuss sexual orientation, sexuality identity, gender identity, as well as intersex identity (differences in sex development) as part of routine history taking.
    - Demonstrate the ability to educate and counsel individuals or family members about intersex variations, sexual orientations, sexuality identities, gender incongruence, gender dysphoria, and gender identities. Demonstrate ability to identify when a mental health referral is needed for the above.
    - Demonstrate knowledge that conversion therapy practices for sexual orientation or gender identity or on people with intersex variations is unethical.
    - Describe differences between Gender Incongruence and Gender Dysphoria.
    - Describe and understand gender identity, the biological and gender binaries, rejection of gender binary, gender non-conforming, gender non-binary, androgynous, and other identities.
    - Demonstrate the ability to educate an individual and family members that Gender Incongruence by itself is not a disorder and does not require clinical intervention. Any form of conversion therapy is unethical.
    - Discuss situations where there is a role for mental health support in Gender Dysphoria i.e., discussing with family, deciding on hormonal treatments or Sex Reassignment Surgery (Gender Affirming Care or Gender Affirmative Therapies or Gender Confirmation Surgery).

The student, at the end of the course should be able to perform independently, the following:

1. Conduct detailed Mental Status Examination (MSE)
2. Cognitive behaviour therapy
3. Supportive psychotherapy
4. Modified ECT and non-invasive neuromodulation
5. Clinical IQ assessment
6. Management of alcohol withdrawal
7. Alcohol intoxication management
8. Opioid withdrawal management
9. Delirious patients
10. Crisis intervention

The student must be able to assess a patient with following symptoms:

1. Psychotic symptoms
2. Seizures true and pseudo seizure
3. Anxiety symptoms
4. Affective symptoms
5. Cognitive symptoms
6. Catatonia
7. Delirium
8. Malingering
9. Behavioral symptoms of developmental disorders

The student, at the end of the course should be able to perform under supervision, the following:

1. Behaviour therapy
2. Family therapy
3. Interpersonal therapy
4. Cognitive behaviour therapy and other newer therapies
5. First level psychological intervention for sexual abuse, sexual assault and domestic violence
6. Genetic counselling

Syllabus

Course Contents:

No limit can be fixed and no fixed number of topics can be prescribed as course contents. The student is expected to know the subject in depth; however emphasis should be on the diseases/health problems most prevalent in that area. Knowledge of recent advances and basic sciences as applicable to his/her specialty should get high priority. Competence in managing behavioural problems commensurate with the specialty must be ensured.

The student must acquire knowledge in the following:

Theoretical concepts:

1. Neurophysiology and Neuro-chemistry
2. Functional and behavioural neuroanatomy
3. Genetics
4. Psychoneuroendocrinology
5. Psychoneuroimmunology
6. Electrophysiology and cognitive neuroscience
7. Neuro-imaging
8. Memory

9. Sleep and circadian rhythm

10. Learning – Theories

11. Theory of personality

12. Clinical Psychology including Psychometry and Psychodiagnostics

13. Transcultural Psychiatry

14. Research Methodology and Statistics

15. Psychodynamics

16. Psychiatric assessment (including History Taking, Neurological Examination, Mental Status Examination, Investigations, Use of rating scales, etc.).

17. Classification In Psychiatry

18. Organic Psychiatry (including Psychological Features and Clinical Assessment of Cerebrovascular Disorders, Delirium, Epilepsy, Head Injury, Headache, HIV – AIDS, Infections, etc.)

19. Movement Disorders (including Medication-Induced Movement Disorders, etc)

20. Substance Related Disorders (including Alcohol-Related Disorders, Amphetamine-Related Disorders, Caffeine-Related Disorders, Cannabis-Related Disorders, Cocaine-Related Disorders, Hallucinogen-Related Disorders, Inhalant-Related Disorders, Nicotine-Related Disorders, Opioid-Related Disorders, Phencyclidine-Related Disorders, Sedative-, Hypnotic-, or Anxiolytic-Related Disorders, etc.)

21. Psychosis (including Schizophrenia, Schizophreniform Disorder, Schizoaffective Disorder, Delusional Disorder, Brief Psychotic Disorder, Shared Psychotic Disorder, etc).

22. Mood Disorders (including Depressive Disorders, Bipolar Disorders, Cyclothymic Disorder, etc.)

23. Anxiety Disorders (including Panic Disorder, Agoraphobia, Phobias, Obsessive-Compulsive Disorder, Generalized Anxiety Disorder, etc).

24. Stress and related disorders (Posttraumatic Stress Disorder, Acute Stress Disorder Adjustment Disorder etc.)

25. Somatoform Disorders (including Somatization Disorder, Undifferentiated Somatoform Disorder, Conversion Disorder, Pain Disorder, Hypochondriasis, Body Dysmorphic Disorder, etc.)

26. Factitious Disorders

27. Dissociative Disorders (including Dissociative Amnesia, Dissociative Fugue, Dissociative Identity Disorder, Depersonalization Disorder, etc.)

28. Personality disorders

29. Sexual disorders, gender dysphoria and psychological issues among LGBTQIA+ groups (including Sexual Desire Disorders, Sexual arousal

Disorders, Orgasmic Disorders, Sexual Pain Disorders, Vaginismus, Paraphilias, etc)

30. Eating Disorders (including Anorexia Nervosa, Bulimia Nervosa, etc.)

31. Sleep Disorders (including Insomnia, Narcolepsy, Breathing-Related Sleep Disorders, Circadian Rhythm Sleep Disorders, Parasomnias, Nightmare Disorder, Sleep Terror Disorder, Sleepwalking Disorder, etc.)

32. Impulse-Control Disorders (including Intermittent Explosive Disorder, Kleptomania, Pyromania, Pathological Gambling, Trichotillomania, etc

33. Psychosomatic Disorders including Consultation Liaison psychiatry

34. Miscellaneous: Non-compliance, Malingering, Antisocial Behaviour, Borderline Intellectual Functioning, Age-Related Cognitive Decline, Bereavement [including Death], Academic Problems, Occupational Problems, Identity Problems, Religious or Spiritual Problems, Acculturation Problems, Phase of Life Problems, Chronic Fatigue Syndrome, etc.)

35. Abuse (Physical / Sexual) or Neglect Of Child /Adult

36. Culture Bound Syndromes

37. Pre-Menstrual Dysphoric Disorder

38. Perinatal Psychiatry

39. Emergencies In Psychiatry including suicide, its management and medico-legal aspect

40. Psychotherapy

41. Psychopharmacology

42. Electro-Convulsive Therapy,Other brain stimulation methods (rTMS, DBS, tDCS and others) and Neurosurgery

43. Child and Adolescent Psychiatry (including Learning Disorders, Motor Skills Disorder, Communication Disorders, Pervasive Developmental Disorders (Autistic Disorder, Rett's Disorder, Childhood Disintegrative Disorder, Asperger's Disorder), Attention-Deficit/Hyperactivity Disorder, Conduct Disorder, Oppositional Defiant Disorder, Pica, Tic Disorders, Elimination Disorders, Separation Anxiety Disorder, Selective Mutism, Reactive Attachment Disorder of Infancy or Early Childhood, Stereotypic Movement Disorder, etc.)

44. Intellectual disability

45. Geriatric Psychiatry (including dementia, legal and ethical issues, positive psychiatry in aging, psychiatric aspects of long term care)

46. Community psychiatry

47. Rehabilitation of psychiatric patients

48. Ethics In Psychiatry

49. Forensic and Legal Psychiatry (including Mental Health Care Act, Persons with Disability Act, Narcotic Drugs and Psychotropic Substance Act etc.)

The student may know the following:

1. History of Psychiatry
2. Epidemiology
3. Mind – the evolving concepts
4. Psychiatry rating scales
5. Placebo Effect
6. Sex and Gender Issues in Psychiatry
7. Psychosurgery

TEACHING AND LEARNING METHODS

Teaching methodology

1. **Lectures:** Lectures are to be kept to a minimum. They may, however, be employed for teaching certain topics. Lectures may be didactic or integrated. Didactic lectures are of least importance; small group discussion such as seminars, journal clubs, symposia, reviews and guest lecturers should get priority for theoretical knowledge. Bedside teaching, grand rounds, structured interactive group discussions and clinical demonstrations should be the hallmark of clinical/practical learning. The student should have hands-on training in performing various procedures and ability to interpret various tests/investigations. Exposure to newer specialized diagnostic/therapeutic procedures concerning the subject should be given. Self learning tools like assignments and case base learning may be promoted.

   The post graduate student should have knowledge of:

   - Psycho-pharmacology and broadening the treatment options using medicines.
   - Neuro-imaging techniques to understand behaviour and psychiatric illness.
   - Community-Psychiatry.
   - Functioning of psychiatric hospital.

   Community Psychiatry should go beyond familiarization with the National Mental Health Programme. The post graduate student should have hands on experience with:

   - Training programmes for primary care physicians
   - Organizing Mental Health Camps

- Carrying out Health Education Activities
- Forensic /Legal Psychiatry
- Integration of Mental Health Care with General Health Care

2. **Thesis writing:** Thesis writing is compulsory.
3. **Research Methodology:** The student should know the basic concepts of research methodology and biostatistics, plan a research project, understand ethical issues of research especially in vulnerable groups such as those with mental illness and intellectual disability as well as minors, be able to retrieve information from the library, use reference managers .
4. **Teaching skills:** The post graduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.
5. **Continuing Medical Education Programmes (CME):** Each student should attend at least two CME programmes, in 3 years.
6. **Conferences:** The student should attend courses, conferences and seminars relevant to the specialty, and encouraged to make presentation in conferences
7. A post graduate student of a postgraduate degree course in broad specialties/super specialties would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.
8. **Seminars:** There should be a weekly seminar in which the PG students present material on assigned topics in rotation. It should be followed by discussion in which all trainees are supposed to participate. Generally, the topics covered should be those that supplement the formal teaching programme.
9. **Case Conference**: A case conference should be held every week where a PG student prepares and presents a case of academic interest by rotation and it is attended by all the members of the Department.
10. **Psychosomatic Rounds**: This is a presentation of a case of psychosomatic illness, or a medical illness with pronounced psychiatric problems. It should be held weekly in collaboration with various departments and attended by the faculty and the PG students of psychiatry and the concerned Department.
11. **Research Forum**: There should be a monthly meeting of one hour each in which the PG students present their plan of research as well as the report of the completed work of their projects. The other research scholars/staff in the department also may participate in it. The faculty, PG students and the non-medical professionals should make critical comments and suggestions.

12. **Journal Club**: A monthly meeting of Journal club should be held in which a senior PG student presents a critical evaluation of a research paper from a journal. All PG students are expected to attend.
13. **Case presentations**: All new in-patients and outpatients cases should be routinely reviewed with one of the Consultants. In addition, the PG student is required to present case material at routine rounds and other case conferences. Senior PG students will conduct evening classes on clinical topics.
14. **Extra-mural activities**: The post graduate students are encouraged to attend certain academic activities in allied subjects held outside parent department e.g. seminars/lectures held at Departments of Sociology, Psychology, Neurology etc.
15. **Psychotherapy tutorials**: These should be held in small groups supervised by a consultant, in which a case is presented by a PG student and psychotherapeutic management discussed.
16. **Rotation:**

Clinical Postings

- A major tenure of posting should be in General Psychiatry. It should include care of in-patients, out-patients, special clinics and maintenance of case records for both in and out patients.
- Exposure to the following areas should be given :-

Schedule of clinical postings for M.D Psychiatry *(36 months)

Area/ Specialty	
Ward and OPD (Concurrent)	18 months
Neurology	2 months
Emergency Medicine/ Internal Medicine	1 month
Consultation Liaison Psychiatry	3 months
Psychiatric hospital and Forensic Psychiatry	1 month
Clinical Psychology	1 month
Addiction Psychiatry	3 months
Child and Adolescent Psychiatry	3 months
Community psychiatry	2 months#
Elective posting	2 months (as per choice in the same Institute)

* The stated duration can be subjected to minor modifications depending on available resources

 # Exposure to community based services should be integral to various postings.

Applicable only for trainees in General Hospital Psychiatric units: Facilities for these need to be arranged.

The post graduate student in Psychiatric hospitals would have extended period of exposure to consultation - liaison psychiatry and other medical specialties. Exposure to community based services should be integral part of various postings. The post graduate student shall be given full responsibility for patient care and record keeping under the supervision of the senior PG students and consultants. The post graduate

student shall also take patients for psychological interventions in an individual as well as group setting. S/he must complete a minimum of 100 hours of supervised psychological interventions.

- **Inter-Unit Rotation of posting**

  Inter-unit rotation in the department should be done for a period of up to one year (divided during the first year and third year while the post graduate student stays in the parent unit throughout the duration of his thesis work).

17. **Clinical meetings:**

    There should be intra - and inter - departmental meetings for discussing the uncommon / interesting medical problems.

18. **Log book:**

    Each student must be asked to present a specified number of cases for clinical discussion, perform procedures/present seminars/review articles from various journals in inter-unit/interdepartmental teaching sessions. They should be entered in a Log Book and signed by the authorized teacher and Head of Department.

19. The Department should encourage e-learning activities.

During the training programme, patient safety is of paramount importance, therefore, skills are to be learnt initially on the models, later to be performed under supervision followed by performing independently. For this purpose, provision of clinical skills laboratories in medical colleges is mandatory. Objective structured clinical examination (OSCE) modules may be developed and used in teaching.

ASSESSMENT

FORMATIVE ASSESSMENT, ie., assessment during the training

Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self directed learning and ability to practice in the system.

Quarterly assessment during the MD training should be based on:

1. Journal based / recent advances learning
2. Patient based /Laboratory or Skill based learning
3. Self directed learning and teaching
4. Departmental and interdepartmental learning activity
5. External and Outreach Activities / CMEs
6. Professionalism and teamwork

The student to be assessed periodically as per categories listed in postgraduate student appraisal form (Annexure I).

SUMMATIVE ASSESSMENT, ie., at the end of training

The summative examination would be carried out as per the Rules given in POSTGRADUATE MEDICAL EDUCATION REGULATIONS, 2000.

The examination shall be in three parts:

1. **Thesis**

   Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination. The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination. A post graduate student shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners.

2. **Theory Examination:**

   There shall be four papers each of three hours duration.

   Paper I: Basic Sciences as related to Psychiatry

   Paper II: Clinical Psychiatry

   Paper III: Psychiatric Specialties

   Paper IV: Recent Advances

3. **Clinical/Practical and Oral/viva voce examination should consist of:**

   - Presentation of long case of Psychiatry
   - Neurology short case
   - A short case Psychiatry
   - Viva –voce

   Due importance should be given to Log Book Records and day-to-day observation during the training.

Recommended Reading

Books (latest edition)

1. Textbook of Psychiatry Publisher: Lippincott Williams and Wilkins, Editors: Benjamin James Sadock, Virginia Alcott Sadock, Pedro Ruiz
2. Kaplan and Sadock's Synopsis of Psychiatry, Editor: RJ Boland, ML Verduin, P Ruiz; Publisher: Wolters Kluver India
3. Introduction to Psychology by Clifford T. Morgan Editors: Clifford T Morgan, Richard A King, John R Weiss, John Schopler, Publisher: MC Graw Hill

4. New Oxford Textbook of Psychiatry Edited by: John R. Geddes, Nancy C. Andreas and Guy M. Goodwin, Publisher: Oxford
5. Stahl's Essential Psychopharmacology: Neuroscientific Basis and Practical Applications, Editor: Stephen M Stahl, Publisher: Cambridge
6. Forensic Psychiatry: RC Jiloha, D Kataria, P Kukreti (Jaypee)
7. ECT administration manual, NIMHANS Editors: Bangalore N Gangadhar, A Shyam Sundar, Jagadisha Thirthalli, Shivarama Varambally, Kesavan Muralidharan, C Naveen Kumar, Preeti Sinha, Biju Viswanath, Publisher: NIMHANS
8. Community Psychiatry in India (Eds Chavan, Gupta, Arun, Sidana, Jadav) Jaypee.
9. Fish's Clinical Psychopathology – Signs and Symptoms In Psychiatry By Patricia Casey, Editor: Patricia Casey, Brendan Kelly, Publisher: Tree Life Media
10. Sims Symptoms in the Mind: Textbook of Descriptive psychopathology, Editor: Femi Oyebode, Publisher: Elsevier
11. Bickerstaff's Neurological Examination in Clinical practice, Editor: Kameshwar Prasad, Ravi Yadav, John Spillane, Publisher: Wiley
12. A Primer of Research, Publication and Presentation: Sandeep Grover, Shahul Amin, Jaypee
13. Maudsley's Prescribing Guidelines in Psychiatry, Editors: Author: David M. Taylor, Thomas R. E. Barnes, Allen Young, Publisher: Wiley
14. Lishman's Organic Psychiatry Editor: Anthony S. David, Simon Fleminger, Michael D. Kopelman, Publisher: Wiley Blackwell
15. Kaufman's Clinical Neurology for Psychiatrists, Elsevier.

Journals

03-05 international Journals and 02 national (all indexed) journals.

Appendix 1

Student appraisal form for MD in Psychiatry

	Element	Less than Satisfactory			Satisfactory			More than satisfactory			Comments
		1	2	3	4	5	6	7	8	9	
1	**Scholastic Aptitude and Learning**										
1.1	Has Knowledge appropriate for level of training										
1.2	Participation and contribution to learning activity (e.g., Journal Club, Seminars, CME etc)										
1.3	Conduct of research and other scholarly activity assigned (e.g. Posters, publications etc.)										
1.4	Documentation of acquisition of competence (eg Log book)										
1.5	Performance in work based assessments										
1.6	Self- directed Learning										
2	**Care of the patient**										
2.1	Ability to provide patient care appropriate to level of training										
2.2	Ability to work with other members of the health care team										
2.3	Ability to communicate appropriately and empathetically with patients families and care givers										
2.4	Ability to do procedures appropriate for the level of training and assigned role										
2.5	Ability to record and document work accurately and appropriate for level of training										
2.6	Participation and contribution to health care quality improvement										
3	**Professional attributes**										
3.1	Responsibility and accountability										
3.2	Contribution to growth of learning of the team										
3.3	Conduct that is ethically appropriate and respectful at all times										
4	**Space for additional comments**										
5	**Disposition**										
	Has this assessment been discussed with the trainee?	Yes	No								
	If not explain										

	Name and Signature of the assesse										
	Name and Signature of the assessor										
	Date										

Module on Gender related Issues and Gender Dysphoria for the MD Curriculum of Psychiatry

At the end of the course the student will be able to:

- Demonstrate the ability to assess the gender identity of an individual and distress caused (if any) due to the individual's own gender identity in simulated environment.
- Describe and understand how to discuss sexual orientation, sexuality identity, gender identity, as well as intersex identity (differences in sex development) as part of routine history taking.
- Demonstrate the ability to educate and counsel individuals or family members about intersex variations, sexual orientations, sexuality identities, gender incongruence, gender dysphoria, and gender identities. Demonstrate ability to identify when a mental health referral is needed for the above.
- Demonstrate knowledge that conversion therapy practices for sexual orientation or gender identity or on people with intersex variations is unethical.
- Describe differences between Gender Incongruence and Gender Dysphoria.
- Describe and understand gender identity, the biological and gender binaries, rejection of gender binary, gender non-conforming, gender non-binary, androgynous, and other identities.
- Demonstrate the ability to educate an individual and family members that Gender Incongruence by itself is not a disorder and does not require clinical intervention. Any form of conversion therapy is unethical.
- Discuss situations where there is a role for mental health support in Gender Dysphoria i.e., discussing with family, deciding on hormonal treatments or Sex Reassignment Surgery (Gender Affirming Care or Gender Affirmative Therapies or Gender Confirmation Surgery).

Subject Expert Group members for preparation of REVISED Guidelines for competency based postgraduate training programme for MD in Psychiatry

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   Delhi 110095.

SYLLABUS FOR M.D. (RADIO-DIAGNOSIS & IMAGING SCIENCES).

GOAL:- The broad goal of the teaching & training of Post-graduate student in Radio-Diagnosis is to
make them understand & implement the knowledge regarding the role of various imaging modalities,
helpful in the management of different clinical conditions. At the end of his/her training, he/she should be
capable to take up a career in teaching institution or in diagnostic center or in research..

OBJECTIVES :-

a) Knowledge:- At the end of the course the student shall be able to:
1) Explain the interaction of tile X-rays with mater to produce an image.
2) Fromiliarize with the principles of various imaging modalities (e.g. .US/CT/MRI) & their applications
in medicine.
3) Explain the biological hazards of ionizing radiation & protective measures.
4) Explain the normal Anatomy, Physiology of various organs and their deviation from normal) & its
consequences.
5} Summarize the fundamental aspects of embryology & alteration in development with reference to
congenital anomalies.
6) Select appropriate imaging modality for- study of specific condition.
7) Explain .the role of imaging, pre-operative, intra-operative & post-operative Conditions.
8) Evaluate role of imaging modalities in various therapeutic applications (lnterventional Radiology)
9) Update information about recent advances in imaging sciences.
10) Effectively organize & supervise the diagnostic proceduces to ensure quality control/assurances

b) Skills:-

At the end of the course the student shall be able to :
1) Make use of conventional & other imaging sciences to achieve definitive diagnosis.
2) Analyse & interpret imaging data.
3) Demonstrate the skills of solving Scientific & clinical problems & decision making.
4) Develop skills as a self:-directed learner recognize cointinuing educational needs, select & use
appropriate learning resources.
5) Demonstrate Comperence in basic concepts of research methodology & be able to critically aualyse
relevant literature.

c) Integration-

Knowledge acquired in Radio diagnosis shall help the students to integrate imaging techniques
with structure & function of the human body in health & disease.

M.D. (RADIODIAGNOSIS)

PAPER –I

Radiation Physics. Protective measures & Radiological procedures,
TOPICS

1) Radiations and production of X-rays
2) X-ray generators
3] Basic interactions between X-Rays and matter
4] Attenuation.
5] Filters and grids.
6] Luminescent screens.
7] Physical and Photographic characteristics of X-ray film & film processing
8] Computed tomography.
9] Ultrasound.
10] Radiation's hazards and protection.
11] Digital Radiography.
12] Nuclear magnetic resonance.
13] Magnetic resonance imaging.
14] Wet processing of films -Chemistry of Developer, fixer etc,
15] Dry processing – chemistry of films & its processing.
16] Radiological procedures(IVU, barium procedures, antegrade pyelography , fistulography, sialography, DCG)

PAPER- II

Radiological Imaging in congenital & systemic diseases- I

a. Respiratory system: Congenital anomalies, Pediatric chest, Chest wall, pleura, diaphragm, Mediastinum, Pulmonary infections, Airway obstruction, Pulmonary neoplasms, Diffuse pulmonary diseases.
b. Cardio-vascular system: Congenital heart Disease's, left-to-right shunts Cyanotic heart diseases,Acquired valvular heart diseases, Ischemic heart disease, Pulmonary circulation, cardiomyopathy, cardiac tumors, Pericardium, thoracic aorta.
c. Gastro Intestinal Tract: Oesophagus, Stomach, Duodenum, Small intestine large bowel, mesentry & omentum, Pediatric abdomen.
d. Hepato-biliary: Liver, Biliary tract, Pancreas.

PAPER-III

Radiological Imaging in congenital & systemic diseases-II

a. Skeletal system: Skeletal trauma benign lesions, malignant lesions, Myeloproliferative & similar disorders, metabolic and endocrine diseases, skeletal dysplasias and malformation syndromes,joint disease, bone and joint infection, radiology of soft tissues, musculo-skeletal system inchildren.
b. Genito-urinary system: Renal parenchymal diseases, Renal masses. Calculus disease and urinaryobstruction, urinary bladder and prostate, Reno-vascular

disorders, injuries, Renal failure andtransplantation, pediatric uroradiology Imaging in obstretics and gynecology, imaging of breast.

c. CNS: Skull, Intra-cranial tumors, Intra-cranial infections, Cerebro-vascular disease, cranial and intracranial malformatins trauma, CSF disturbances, degenerative diseases of spine infections of spine, spinal tumours.

PAPE R – IV

Miscellaneous, Interventional Radiology & Recent advances and Newer imaging.

a) Orbit , ENT, dental
b) Reticuloendothelial system
c) Interventional radiology:
    I. HSG & FTR
    II. 4 vessel angiography
    III. Biliary intervention(PTBD,PTC)
    IV. PCN
    V. Laser ablation of varicose veins
    VI. RFA/ chemoembolisation of hepatic tumour and malformations.
    VII. Vertebroplasty.
    VIII. Hemangioma and AVM management.

Syllabus for MD

A. RADIOLOGICAL PHYSICS & X-RAY TECHNOLOGY:

1. Radiation
2. Production of X -Rays
3. X- Ray Generators :
4. Basic Interaction between X- Rays and Matter
5. Attenuation
6. Filters
7. X- Ray beam restrictors
8. Physical characteristics of x- Ray films & film Processing
9. Photographic characteristics of X- Ray films
10. Fluroscopic imaging and image intensifier
11. Viewing & recording of the Fluroscopic Image
12. The Radiographic Image
13. Geometry of the Radiographic Image
14. Computed Tomography
15. Ultrasound
16. Digital Radiography
17. Nuclear Magnetic Resonance
18. Magnetic Resonance Imaging
19. Radiation hazards & Protection
20 Electric & Protection
21. Cine Angiography:
22. Atomic structure, Radioactive Isotopes & Gamma Camera
23. Positron Emission Tomography
24. Digital Subtraction Angiography
25. Catheters, guides wires, dilators, balloons & stents
26. Pictorial Achieving & Communicating System (PACS)
27. DICOM

B. DARK ROOM TECHNIQUES:

1. Intensifying screens /construction, types and advantages :
2. Rare earth intensifying screens :
3. Intensification factor :
4. Cassette: .construction & care
5. Factors affecting image details :
6. Factors affecting image contrast & density :
7. Grids : construction & types
8. Cones & collimeter :
9. X Ray films -construction, types & storage :

C. BASIC RADIOLOGY

I. IMAGING TECHNIQUIES AND MODALITIES

a) Department Organization: Digital Imaging and PACS:
   i. Digital imaging and PACS: Picture Reliving and Communication System
   ii. Digital Imaging and PACS: what should a radiologist expect from PACS
   iii. Digital Imaging and PACS: Image processing in Computed Radiography
b. Intravascular Contrast Media
c. Whole body Computed Tomography: Recent Advances
d. Magnetic Resonance Imaging Basic Principles
e. Ultrasound : general Principles
f. Radionuclide imaging
   i. Radionuclide imaging: General Principles
   ii. Radionuclide imaging: Pediatric Nuclear Medicine
g. Dual Energy X-ray Absorptiometry
h. Functional and Physiological Imaging
i. Medicolegal issues in Diagnostic Radiology
j. Radiation Protection and patient doses in diagnostic radiology

II. RESPIRATORY SYSTEM :

1.1 Techniques of Investigations

1.11 Standard Techniques
1.1.2 Tomography: a) Conventional film Tomography
b) Computed Tomography
1.1.3 Digital Radiography
1.1.4 Magnetic Resonance Imaging
1.1.5 Radionuclide Imaging a) Ventilation
b) Other thoracic scanning techniques
1.1.6 Ultrasound
1.1.7 Angiography
1.1.8 Lung Biopsy & Other Interventional Techniques.

1.2 Normal Chest:

1.2.1 The Lungs (Radiological Anatomy} & CT Terminology)
1.2.2 The Central Airways
1.2.3 The Lungs beyond Hila
1.2.4 The Hila
1.2.5 The Mediastinum :
a) CT & MRI
b) Plain film appearances
   i. The junctional lines :
   ii. The right Mediastinum above azygous vein
   iii. The left Mediastinum above Aortic arch
   iv. vi) The supra aortic Mediastinum on lateral view
   v. v) The right Middle Mediastinum border below azygous arch.
   vi. vi) The left cardiac border below aortic arch
   vii. vii) The para spinal lines
   viii. viii) The retrosternal line
1.2.6 The Diaphragm

1.3 The Chest Wall, Pleura & Diphragm

1.3.1 Chest Wall :

i) Soft tissue /Breasts

ii) Ribs /Sternum/Clavicle, Spine

1.3.2 The Pleura :

i) Normal Pleura

ii) Pleural Pathologies

1.3.3 The Diaphragm :

i) Height/ Eventration/Movements/Paralysis

ii) Hernias/Trauma/Neoplasm

1.4 The Mediastinum :

1.4.1 Techniques. .

1.4.2 Mediastinal Masses: i) Thyroid/ Para Thyroid Messes/Thymic tumors/Tymic hyperplasia/Teratoma/ Cermcell Tumor.

ii) Mediastinal lymphadenopthy

iii) Neurogenic Tumors

iv) Extra medullar heamatopes/Mesenchymal Iumors/ Hernarationof / Mediastinal lipomatosis/ Aneusyrum

1.4.3 Differential Diagnosis:

1.4.4 Other Mediastinal Lesions: i) Acute/ fibrosing Medlastinitis

1.5 Pulmonary Infections in Adults .

1.5.1 Pneumonia

1.5.2 Associated features and complications of pneumonia

1.5.3 Pulmonary tuberculosis

1.5.4 HIV & AIDS

1.6 Large Airway Obstruction :

1.6.1 Collapse: General features /Collapse of individual lobes / entire lung/ segmental collapse/

Rounded /obstructive collapse

1.6.2 Obstructive Pneumonities/ Bronchoscope/Broncheietasis

1.7 Pulmonary lobar Collapse essential considerations :

1.8 Chronic inflow Obstruction :

1.8.1 Asthama:

1.8.2 Choronic Bronchitis and Emphysema

1.8.3 Bronchiolitis

1.9 Pulmonary Neoplasms :

1 Bronchial Carcinomas

2 Benign Pulmonary Tumors

3 Malignant Lymphoma

4 Metastases

5 The solitary Pulmonary Nodule

2.0 Diffuse Pulmonary. Disease / Industrial Lung Disease / HRCT :

1 Pulmonary Oedema :

2 Diffuse pulmonary Haemorrhage

3 Inhalation of particulate matter

4 Diffuse pulmonary Fibrosis

5 Sarcoidosis / Collagen Vascular Disease *I* Systemic Vasculitidis *I* Lymphoid Disorders of Lungs / Pulmonary Eosinophilia *I* Drug induced Lung Disease

2.1 Chest Trauma :

2.2 Pulmonary Thromboembolism :

Imaging Chest Radiograph/ Radionuclide Study *I* Pulmonary Arteriography/ CT / MRI

2.3 .Post Operative & Critically ill Patients :

1 Cardiopulmonary Disease
2 Post Thoracotomy Radiograph
3 Support and Monitoring apparatus
4 Radiation Therapy

2.4 Chest Radiography after Lung Transplantation :

2.5 Congenital Pulmonary Anamolies :

1 Abnormal Development of Lung Bud
2 Abnormalities of separation of the lung had from the foregut
3 Abnormalities of Pulmonary Vasculature
4 Ectopic of Hamartomatous Development

2.6 The Infant and Young Child :

1 Pathologies of Diaphragm
2 Pleural Abnormalities
3 Inflammation
4 Airway Obstruction
5 Diffuse Lung Disease .
6 Respiratory Distress in Newborn Baby

2.7 Interventional Techniques in Thoracs:

1 Biopsy Procedures
2 Thoracic Drainage Procedure
3 Thoracic Sympathectomy
4 Therapeutic Embolisation
5 Dilatation & Stenting Techniques
6 Extraction Techniques.

III. THE HEART AND GREAT VESSELS

3.1 Cardiac Anatomy and Enlargement- :

3.1.1 Plain Radiography
3.1.2 Enlargement of various chambers on Plain Radiography

3.2 Magnetic Resonance of Heart and Circulation .

3.3 Congenital Heart Disease :

1 General Principles
2 Left to right shunts .
3 Central Sinuses
4 Other Congenital Heart Disease

3.4 Aquired Heart Disease: i) Non Rheumatic/ Rheumatic Mitral VD
ii) Tricuspid VD
iii) Aortic VD

3.5 Ischaemic Heart Disese : i) Coronary Atreriography
ii) Left Ventriculography
iii) Angina Pectoris
iv) Myocardial Infarction
v) Mechanical Complication of MI

3.6 Pumlonary Circulation : i) Anatomy and Physiology
ii) Pulmonary Vascularity in Heart Disease
iii) Pulmonary Arterial hypertension/ Its Imaging
iv) MR in Pulmonary Vascular Abnormalities .

3.7 Cadiomyopathy, Cardio Tumors, Trauma
3.8 The Imaging of Prosthetic Cardiac .Valves
3.9 The pericardium
3.10 Thoracic Aorta

IV .THE GASTROINTESTINAL TRACT:

The Esophagus
1 Anatomy .and Functions
2 Methods of Examination
3 Pathologies of Esophagus
4 Motility Disorders
5 Extrinsic lesions/ miscellaneous conditions

The stomach
1 Radiological anatomy and methods of examination
2 Inflammatory Diseases
3 Neoplastic Conditions
4 Radionuclide Studies in Stomach

The Duodenum
1 Anatomy and Normal Appearances
2 Methods of Radiological Examination
3 Peptic ulceration
4 Gastro heterotopia /diverticula
5 Neoplasms benign and malignant

The Small Intestine
1 Anatomy and normal appearances
2 Methods of radiological examination
3 Crohns disease/Coeliac Disease/Neoplasms/various conditions

The Large Bowel
1 Anatomy and Normal Appearances
2 Methods of Radiological Examination
3 Tumors
4 Diverticular Disease
5 Colitis
6 Aids
7 Miscellaneous Conditions

Peritoneum, Mesentery and Omentum
1 Peritoneal spaces and reflections
2 Abnormalities of Peritoneum
3 Abnormalities of Mesentry
4 Abnormalities of greater Omentum

Gastrointestinal Angiography.
1 General Consideration
2 Gastro intestinal bleeding

Interventional Radiology in Gastrointestinal tract

1 Introduction
2 Esophagus
.3 Stomach and Duodenum
4 Small Intestine
5 Colon and Rectum

Pediatric Gastrointestinal Radiology

1 The Neonate
2 The Infant and Older Child

V. Liver, Biliary tract, Pancreas, Endocrine System and Lymphoma

Liver

1 Normal and variant Anatomy
2 Liver Imaging Techniques
3 Diffuse Disease
4 Focal Disease
5 Intervention

The Biliary Tract

1 Anatomic Consideration
2 Methods of investigation
3 Biliary Disorders

Interventional Techniques Hepatobiliary System

1 Liver Biopsy
2 Biliary Obstruction
3 Malignant Biliary Obstruction
4 Percutaneous Cholangiography and Biliary Drainage Procedures
5 Vascular Interventional Techniques in Hepatobiliry System

The Pancreas

1 Embryology and Anatomy
2 Congenital Anomalies
3 Multisystem Diseases with Pancreatic involvement
4 Pancreatitis
5 Pancreatic Neoplasms
6 Trauma
7 Interventional Radiology in Pancreas

Imaging of the Endocrine System :

1 Hypothalamic-Pituitary Axis
2 Pineal Gland
3 Thyroid Gland
4 Parathyroid Gland
5 Pancreatic & Gastrointestinal Endocrine Disorders
6 Carcinoid Tumors
7 Adrenal Glands
8 Female Reproductive System .
9 Male Reproductive System

Reticuloendothelial Disorders : Lymphoma

1 Epidermilogy
2 Histopathological Classification
3 Staging Investigation and Management
4 Extranodal Manifestation of Lymphoma
5 Monitoring response to therapy

Reticuloendothenial Disorders: The Spleen

1 Imaging Techniques
2 Normal Anatomy
3 Splenomegaly
4 Benign Mass Lesions
5 Malignant Mass Lesions
6 Splenic Trauma

VI Genito Urinary Tract :

6.1 Methods of Investigation :

6.2 Radionuclide Imaging in Genito Urinary Tract :

6.3 Urodynamics

6.4 Reno Vascular Disease:

6.4.1 Renal Arteriography
6.4.2 Vascular Abnormalities
6.4.3 Radiological Management of Reno Vascular Disease

6.5 Renal Parenchymal Disease

6.5.1 Normal Appearance
6.5.2 Renal Parenchymal Disease
6.5.3 Parasitic Infections

6.6 Renal Masses :

6.6.1 Methods of Analysis
6.6.2 Pathological Renal Masses
6.3 Neoplastic Renal Masses

6.7 Calculus Disease & Urothelial Lesions

6.7.1 Calculus Disease
6.7.2 Nephrocalcinosis
6.7.3 Urothelial Tumors

6.8 Urinary Obstruction:

6.8.1 Pathophysiology
6.8.2 Causes of Obstruction

6.9 Radiological Evaluation of Urinary Bladder, Prostrate & Urethra :

6.10 Injuries to the Genito Urinary Tract :

6.11 Renal Failure and Transplantation :

6.12 Interventional Uroradiology :

6.13 Imaging of the Kidneys & Urinary Tract in Children

6.13.1 Embryology
6.13.2 Techniques .
6.13.3 Interventional Procedure "

6.14 Imaging of Paediatric Pelvis :

6.14.1 Imaging Techniques ;
6.14.2 Normal Anatomy
6.14.3 Congenital Anomalies
6.14.4 Pelvis Masses
6.14.5 Scrotal Disease

VII Skeletal System :
7.1 Skeletal Trauma
7.2 Bone Tumors : Generals Characteristic & Benign Lesions
7.3 Bone Tumors : Malignant Lesions
7.4 Myelproliferative and Similar Disorders
7.4.1 Generalised/Localised Decreased in Bone Density
7.4.2 Generalised/Localised Increased in Bone Density
7.4.3 Delayed Skeletal Matuarity
7.5 Metabolic and Endocrine Disease of the Skeletal
7.6 Skeletal Dysplasias and Malformation Syndrome
7.7 Joints Diseases :
7.7.1 Rhumatiod Arthritis
7.7.2 Other Connective Tissue Disease
7.7.3 Crystal Deposition Arthropathy
7.7.4 Degenerative Joint Disorders/Degenerative spine
7.7.5 Arthrography/ HPOA/ Pachy Dermoperiostritis
7.8 Bone and Soft tissue Infection :
7.9 Imaging of Soft tissue :
7.10 Bone Tumors in Children :
7.10.1 Imaging approach
7.10.2 Benign Bone Tumors
7.10.3 Malignant Bone Tumors
7.11 The Radiology of Non Accidental Injry in Children :
7.12 Paediatric Musculo -Skeletal Trauma
7.13 Radiology of Arthritides in Children
7.14 Radiology of Soft tissue in Children
7.15 Bone and Soft tissue infection in Children.
VIII. The Reproductive System :
8.1 Ultrasound in Obstetrics and Gynaecology
8.1.1 Indication
8.1.2 Instrumentation in US Techniques
8.1.3 Gynecological infertility
8.1.4 Assesing Tubal Patency
8.2 Imaging in Gynaecology
8.3 Hysterosalpingography
8.4 The Breast & its Imaging
8.5 Breast Cancer
8.6 Male Reproductive System
IX Central Nerve System :
9.1 Skull and Brain : Methods of Examination and Anatomy
9.2 Cranial and Intracranial Pathology : Tumors in Adults
Cerebro Vascular Disease and Non Traumatic
Intracranial Haemorrhage
Infections, AIDS, Demyelinating and Metabolic
Disease
9.3 Spine: Method of Investigation
9.4 Imaging of Spinal Pathology
9.5 Scoliosis in Children
9.6 Neonatal Head and Spine Sonography
9.7 Neurology in Children

X. The Orbit; ENT; Face; Teeth:

10.1. The Orbit

10.1.1 Anatomy / Techniques
10.1.2 Intraoccular Abnormalities
10.1.3 Lacrimal Gland Tumors
10.1.4 Muscular Tumors
10.1.5 Intra/Extra Canal Tumors

10.2 Ear, Nose and Throat Radiology

10.2.1 The Ear
10.2.2 Nose and Paranasal Sinuses
10.2.3 Phrynx

10.3. Maxillofacial Radiology

10.3.1 Fractures of Maxilla
10.3.2 TM Joint
10.3.3 Salivary Glands

10.4. Dental Radiology

10.5. Pediatrics, Eye & Orbit :

10.5.1 Imaging Techniques
10.5.2 Child with Proptosis or an Orbital mass
10.5.3 Child with Orbital Infection
10.5.4 .Child with White Eye
10.5.5 Child with Development Abnormalities

10.6. Paediatric ENT Imaging

XI) Interventional radiology:

1. HSG & FTR
2. 4 vessel angiography
3. Biliary intervention(PTBD,PTC)
4. PCN
5. Laser ablation of varicose veins
6. RFA/ chemoembolisation of hepatic tumour and malformations.
7. Vertebroplasty.
8. Hemangioma and AVM management.

Passed by Academic Council (Resolution No. 355/2006) dtd. 30/05/2006, subject to Uniformity in the Examination pattern.

BOARD OF STUDIES MEDICAL FACULTY(P.G.EDUCATION)
MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES
NASHIK-422004.

GOAL

1. **To develop competent specialist and medical teachers who can appreciate health needs of the community, perform professional obligations observing ethics and keeping in view the objectives of national health policy at various levels of health care delivery system as well as be aware of contemporary and recent developments in the concerned discipline and updating with latest advances.**

A) General suggestions .

i) Uniform nomenclature – it is unanimously decided that the nomenclature of Post graduate degree and diploma should be broad based. (either Respiratory Medicine / Pulmonary Medicine) eg. MD (Branch V) Respiratory Medicine,
Diploma in Respiratory Medicine (DRD) or Diploma in Pulmonary Medicine.

ii) Duration -PG Diploma should be of two years duration & PG degree should be of three years duration

iii) Affiliation- The department of a Medical College / Institution should be affiliated. It should be confirmed/ approved and then the teacher functioning in approved department should be recognized.

a. Criteria for affiliation-

- Institution should be first affiliated to university as per laid down norms under 11.2 minimum requirements for PG institution (M.C.I).
- Department on clinical side should have:

1. No. of units – (at least one)

2. Teaching component – teacher should posses the qualifications and experience prescribed by Medical Council of India

Total teaching experience in the subject of 8 years for which recognition is sought out of which at least five years as lecturer or Asst. Prof.

a) HOD Professor (preferably either recognized or eligible to be recognized for PG teacher ship)

b) Unit head – Prof./ Addl. Prof / Asso. Prof. (preferably either recognized or eligible to be recognized for PG teacher ship) if there is one unit it should be headed by Professor only but second or subsequent additional unit may be headed by either Prof ./ Addl. Prof/ Asso. Prof.

c) Other faculty – at least one more qualified teaching faculty (preferably either recognized or eligible to be recognized for PG teacher ship)

Any PG teacher can simultaneously be recognized for MD and PG diploma and can enroll students for both. In addition their teachership should be accorded permission for DNB (National Board of examinations) , Diploma / fellowship of college of Physicians and Surgeons Mumbai, along with certification / fellowship courses that are likely to be started by MUHS in the light of paucity of registration available for Maharashtra State students.

d) Bed strength – minimum 30 sanctioned beds in an indoor unit (at least one unit) For MD / MS and minimum 20 sanctioned beds in an indoor unit for PG Diploma if recognition is for both MD & PG Diploma minimum 30 sanctioned beds in an indoor unit (at least one unit) required.

e) Residents – minimum one resident per 10 beds- (3-residents per 30 beded unit) They are name as Junior Residents for broad specialty JR I (first year) JR II (second year) JR III (third year) Fourth year residency may be adopted to complete three years teaching experience to fulfill eligibility criteria for lecturer post. This post should only be given to PG degree qualified resident.

One teaching unit should have minimum two qualified teaching faculty (preferably either recognized or eligible to be recognized for PG teacher ship)

f) Other staff :

In addition to teaching faculty staff the strength of technical paramedical staff shall be as per the staff strength prescribed for admitting 50 – 100 – 150 or multiple of 100 MBBS admissions regulations

G. Enrolment :

Each PG teacher can enroll only one student for MD / MS per year and one PG Diploma students per year.

4) Laboratory facilities:

a) Central Lab facilities -for training Postgraduate students should be available preferably computerized automatic analytic type equipments be available.Central Direct microscopy, Fluorescent microscopy, Culture & Susceptibility for organism inclusive of AFB be available

b) Equipments -should be functional throughout the year quality control and accuracy be monitor periodically. The facilities should be updated in lieu of the advancement in knowledge, technology and research.

c) Central Biomedical waste management is mandatory.

5) Radiology :

Conventional, Ultrasound, Spiral CT/ Multislice CT, MRI, 2D Echo, Colored venous and arterial Doppler, CT guided Biopsy are few of the facilities that should be available. Further as per the advancement in our knowledge the facilities should be updated.

Department as well as Central **Medical Record Section** should be available (preferably computerized).

6)Library:

Department as well as Central medical library in possession of standard text books, index journals, year books, recent advances periodical should be available.

At least central Library should have PC's with colored laser printer, Internet facilities, Fax, Xeroxing machine along with educational CD's.

7) Equipments:

Each unit of the department should have clinical/ procedure room with facilities for pleural tapping and biopsy, FNAB, Pulse oximeter, multifunction bed, trolleys, with at least four X-ray and scanplate mountable viewing box, four to five nebulizers.

a)Pulmonary Function Laboratory having facilities to perform spiormetry, Airways resistance and conductance, diffusion study, Bronchial challenge test, allergy-testing facility with emergency management arrangement, six minutes walk work test facilities.

b)Bronchoscopy room having flexible fibroptic bronchoscope, with standard accessories, leakage tester, monitor , CCTV camera, recording facilities, nebulizer scope sterilization tray central cupboard to hang the scope with punch biopsy, brush biopsy, channel cleaning forceps, suction and oxygen ports or portable machine and cylinder.

c)Respiratory critical care/ high dependency ward: to take care of seriously/ critically ill patients. Preferably at least four bedded ward having facilities of centralized oxygen and suctioning Non – invasive/ invasive ventilators and different types of masks and oxygen canulae. If departmental critical center is not available hospitals central intensive care unit must be available with easy access to the patient from the department.

d) Sleep Laboratory:

1. Polysomnography machine with adequate channels, SPO2 measurement having facilities for up gradation
2. Monitoring treatment modality with unilevel / bilevel positive airway pressure equipment.
3. Separate room with proper ventilation

CURRICULUM
(syllabus)
BASIC SCIENCES

I - ANATOMY OF THE LUNG & DEVELOPMENT & GENETICS OF LUNG DISEASES.

II - PHYSIOLOGY :

- Respiratory Mechanics
- Physiology of Respiration & Ventilation.
- Physiological basis of pulmonary function testing & arterial blood gases.
- Acid based disturbances
- Physiology aspects related to mechanical ventilation
- Physiology related to endocrine aspects of lung
- Sleep physiology
- Patho-physiology of all disorders pertaining to pulmonary medicine.

III - PUBLIC HEALTH & EPIDEMIOLOGY:

- Epidemiological aspects of major respiratory and public health problems like tuberculosis, asthma, interstitial lung disease & occupational & environmental disorders.

IV - PULMONARY REHABILATION

V -SURGICAL ASPECTS;

- Surgical interventions in various pulmonary disorders including trauma, infections & lung transplantation & minimally invasive interventions.

VI- MEDICO-LEGAL ASPECTS:

- Principles of care for patient requiring mechanical ventilation.
- Long term oxygen therapy
- Compensation (occupational lung disorders)
- Fitness & disability evaluation.
- Personal Protective measures for occupational health, biosafety guidelines for medical equipment & waste disposal.
- Human Rights, ethical aspects, consent for procedures/newer drug development. Aspects related to medical procedures & interventions performed in various pulmonary disorders.

VII- RECENT ADVANCES :

- Drug development in respiratory medicine.
- Sleep Medicine
- Invasive diagnostic techniques
- Lung in extreme conditions.

VIII- INFECTIONS :

- Tuberculosis (pulmonary & extrapulmonary)
- Opportunistic infections related to immunocompromised state & other infections in immunocompetent individuals.
- Infections related to systemic illnesses

IX - ENVIRONMENTAL MEDICINE RELATED TO PULMONARY MEDICINE WITH SPECIAL REFERENCE TO AIR POLLUTION & OCCUPATIONAL DISEASES.

X - PULMONARY CRITICAL CARE ASPECTS :

XI -CONVENTIONAL CHEST RADIOLOGY & LUNG IMAGING

XII - PULMONARY CIRCULATORY DISORDERS.

XIII - DISEASES OF AIRWAYS

XIV - NEOPLASTIC DISEASES

XV - DISEASES OF MEDIASTINUM

XVI - INTERSTITIAL LUNG DISEASE

XVII - PULMONARY INFECTIONS.

XVIII - PROBLEM BASED LEARNING FOR THEORY & PRACTICAL ON EACH ASPECT (REFERENCE : W.H.O.) :

- Cause of the complaint
- Ways to differentiate between possible causes
- Pathophysiological mechanisms responsible for the complaint and clinical conditions.
- Best possible management strategies.
- Prevention of recurrence.

In addition to the above-cited syllabus a student should acquire theoretical knowledge, dissertation, clinical and communication skills as well as training in research methodology.

B) Recognition of textbooks, reference books & journals

a) **Text Books**:
Respiratory Diseases (I & II) - Crofton & Douglas
Pulmonary Diseases & Disorders - A. Fishman
Diseases of Chest (I,II,III &IV) - Fraser & Pare

b) **Reference books:**
Principles of Critical Care - Farokh E. Udwadia
Pulmonary Function Testing - Gregg L. Ruppel
Bronchoscopy -Udaya B. S.Prakash
Principles & Practices of Sleep Medicine - Kryger & Roth
Clinical application of Blood Gases - Barry A.Shapiro
Occupational Lung Disorders - Park & Park
High Resolution CT of the Lung - W. Richard Webb
Surgical Aspects of Tuberculosis - Gibbons
Tuberculosis - Toman

c)**Journals:**
Thorax
American Review of Critical Care & Respiratory Diseases.
Indian Journal of Chest Diseases
European Journal of Respiratory Diseases.
Clinics in Chest Medicine.
Recent Advances in Respiratory Medicine.

C) Pattern of P.G.Degree and Diploma Examinations

(As per Direction No. 01/2008 dtd. 26/05/2008)

Appointment of examiners:

a. There will be two internal examiners and two external examiners (from out of state).

b. If the total number of the candidates are more than 39 then instead of four eight examiners four internal & four external can be appointed.

c.In the event of more than eight candidates the practical examination should be held for more than one day depending upon the number of candidates in the multiples of eight.

d.If a corum of four / eight examiners is not completed than the external examiners can be appointed from the existing list however at no point of time both external examiners will be retired internal examiners empanelled as externals.

e. In case of crisis examination can be carried out with minimum of three examiners of which at least one should be an external examiner with prior permission of M.C.I.

f.. An internal examiner ordinarily be appointed for not more than two terms in succession or with in two years at any turn of the college.

g.examination of MD/ MS and PG diploma can be held in Jan & July Each year .

h. For PG degree and diploma four examiners are to be appointed and the same set of examiners can conduct both MD/ MS and PG diploma in there respective term to void duplication and extra expenses thereof.

i.Same set of examiners should assess dissertations, theory and practical of all the candidates appearing for the same examination.

J.PG students only should be allowed to appear for examination on passing assessment of dissertations by the respective set of examiners.

k.There will be chairman/ convener who is supposed to moderate paper setting and practical examination, submission of result to the university. Such person should essentially be an internal examiner and who will officiate for only one term at the time and not more than one in succession.

GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR MD IN ANAESTHESIOLOGY

Preamble

The purpose of PG education is to create specialists who would provide high quality health care and advance the cause of science through research & training.

A post graduate specialist having undergone the required training in anesthesiology should be able to recognize the health needs of the community. He or she should be competent to handle effectively medical problems and should be aware of the recent advances pertaining to his/her specialty. She/he should be highly competent anesthesiologist with broad range of skills that will enable him/her to practice anesthesiology independently. The PG student should also acquire the basic skills in teaching of medical/para-medical students. She/he is also expected to know the principles of research methodology and modes of consulting library. She/he should attend conferences, workshops and CMEs regularly to upgrade his/her knowledge.

The purpose of this document is to provide teachers and learners illustrative guidelines to achieve defined outcomes through learning and assessment. This document was prepared by various subject-content specialists. The Reconciliation Board of the Academic Committee has attempted to render uniformity without compromise to purpose and content of the document. Compromise in purity of syntax has been made in order to preserve the purpose and content. This has necessitated retention of “domains of learning” under the heading “competencies”.

SUBJECT SPECIFIC LEARNING OBJECTIVES

The training should have clear objective, is competency based, is well planned & evaluated, is supervised and delivered by well trained teachers. It will have special emphasis on attitude and behavior, safety, communication, presentation, audit, teaching, ethics and law and management.

No limit can be fixed and on the number of topics that can be prescribed as course contents. The student is expected to know his/her subject in depth from various text books and journals; however more emphasis should be on the diseases/health problems most prevalent in that area. Knowledge of recent advances and basic sciences as applicable to his/her specialty should get high priority. Competency in anaesthesia skills commensurate with the specialty (actual hand on training) must be ensured.

Specific learning objectives:

1. **Theoretical knowledge**: The student should have fair knowledge of basic sciences (Anatomy, Physiology, Biochemistry, Microbiology, Pathology, Pharmacology, Statistics and Physics) as applied to Anaesthesia. The student should acquire in-depth knowledge including recent advances. He/she should be fully conversant with the bedside procedures (diagnostic and therapeutic) and have knowledge of latest diagnostics and therapeutics procedures available including radiological methods.

2. **Teaching:** The student should learn the basic methodology of teaching and develop competence in teaching medical/paramedical students. The student should be familiar with the latest teaching (computer and power point presentation) modes including simulators training and evidence based medical education.
3. **Attitude development:** The student should develop attitude that leads to appropriate communication with colleagues to function in a group in Operating Room /Intensive Care Unit, and develop the ability to function as a leader in the operating room.

SUBJECT SPECIFIC COMPETENCIES

The student during the training programme, should acquire the following competencies:

A. Cognitive domain

- Demonstrate knowledge of Anatomy related to;
  - ❖ Diaphragm, upper and lower airway, heart and coronary circulation ,
  - ❖ Regional anaesthesia - field block, central neuraxial, blockade, block for acute pain states
  - ❖ Procedures like -Intramuscular injections, arterial and venous cannulations and
  - ❖ Patient Positioning under anaesthesia

- Demonstrate knowledge of Physiology of various systems (respiratory, cardiovascular, hepatobiliary, renal, endocrine, pregnancy, haematological, neuromuscular, regulation of temperature and metabolism, stress response, cerebral blood flow and ICP, central, autonomic and peripheral nervous systems, metabolic response to stress and trauma) in detail and translate its application in a problem solving manner.
- Demonstrate knowledge of Biochemistry relevant to fluid balance and blood transfusion, perioperative fluid therapy, acid base homeostasis in health and diseases.
- Demonstrate knowledge of commonly used drugs in anaesthesia practice (premedication, induction agents - intra-venous and inhalational, neuromuscular blocking agents and reversal of muscle relaxants) - general principles, concepts of

pharmacokinetics and pharmacodynamics, drug interactions with the other drugs taken concomitantly by the patient and anaphylactoid reactions.

- Demonstrate knowledge of gas laws, medical gas supply system, fluidics, electricity, diathermy and oxygen therapy.
- Demonstrate knowledge of 'principles of physics' that govern functions of basic anaesthesia delivery equipment, airway devices – (laryngoscopes, airways etc), breathing systems and monitors, fiber optics, Lasers, Pacemakers and defibrillators, monitoring equipments (used for assessment of cardiac functions, temperature, respiratory functions, blood gases, intracranial pressure, depth of anaesthesia and neuromuscular block), Sterilization of equipments, manufacture, filling and transport of gases and liquid oxygen. etc.
- Demonstrate knowledge of importance of pre-anaesthetic assessment and optimization of a patient; consisting of evaluation, interpretation of laboratory investigation as applied to the care of the patients in planning and conduct of general anaesthesia.
- Demonstrate knowledge of basic life support, advanced cardiac, trauma life support, and neonatal resuscitation according to latest guidelines.
- Demonstrate knowledge of principles of sterilization and universal precautions, selection, maintenance and sterilization of anaesthesia and related equipment, Infection control, cross contamination in OT and ICU. Immune response and anaesthesia.
- Describe the development and history of anaesthesia as a specialty with knowledge of important personalities who have contributed towards it.
- Demonstrate knowledge of principles of artificial ventilation, management of unconscious patients, oxygen therapy, shock- (pathophysiology and management) and various protocols related to Intensive Care Unit.
- Demonstrate knowledge of post-operative care in the post-anaesthesia recovery room, in terms of management of
    - ❖ Post-operative pain: various modalities
    - ❖ Nausea and vomiting
    - ❖ Identified emergencies and postoperative complications.
    - ❖ Special precautions to be taken in specific surgical patients.
- Demonstrate knowledge of acute pain management, chronic pain therapy & therapeutic nerve blocks, acupuncture, acupressure and other non-conventional methods of treatment.
- Describe documentation, medico-legal aspects of anaesthesia and concept of informed consent.
- Demonstrate knowledge of research methodology and basics of biostatistics relevant to data collection, analysis, record keeping in anaesthesia, comparison and estimation of significance.

- Demonstrate ability to interpret blood gas analysis and other relevant biochemical values, various function tests and basics of measurement techniques, ECG.
- Explain blood coagulation mechanism, and their disturbances, rational use of blood and blood components.
- Demonstrate knowledge pertaining to special anaesthetic techniques as relevant to:
    - ❖ Outpatient anaesthesia, hypotensive anaesthesia, anaesthesia in abnormal environments including rural area and calamitous situations
    - ❖ Associated medical disorders in surgical patients
    - ❖ Geriatric and pediatric anaesthesia, Emergency, ENT, orthopedic, ophthalmology, obstetrics, dental, radio-diagnosis and radiotherapy.
    - ❖ Induced hypothermia, incidental, environmental safety of patient.
    - ❖ Malignant hyperthermia, myasthenia gravis, GB syndrome and other neuromuscular diseases, obesity, COPD, Diabetes mellitus, bronchial asthma and hypertensive crises..
    - ❖ Principles of anaesthetic management of neuro/cardiac/thoracic/vascular/ transplantation/burns and plastic surgery.
    - ❖ Anaesthesia for patients with severe cardiac, respiratory, renal and hepatobiliary disorder posted for unrelated surgery
    - ❖ Shock, types, pathogenesis and management of patients in shock, renal failure, critically ill and/or on ventilator, Multiple organ failure
- Demonstrate knowledge pertaining to care of terminally ill, Hospices management, Do not resuscitate orders.
- Demonstrate knowledge of general principles of medical audit and Critical incident reporting.
- Demonstrate knowledge of Ethics and clinical trial.
- Demonstrate knowledge of Hospital, ICU and OT design and planning.
- Demonstrate knowledge of Medical education including evidence based medical education.
- Demonstrate knowledge of principles of human resources and material management.

B. Affective Domain:

1. Should be able to function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the patient and the clinician or other colleagues to provide the best possible diagnosis or opinion.
2. Always adopt ethical principles and maintain proper etiquette in dealings with patients, relatives and other health personnel and to respect the rights of the patient including the right to information and second opinion.

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3. Develop communication skills to word reports and professional opinion as well as to interact with patients, relatives, peers and paramedical staff, and for effective teaching.

C. Psychomotor domain

At the end of the course, the student should acquire skills in the following broad areas and be able to:

- Demonstrate ability **as a perioperative physician**, in terms of
  - ❖ Acquiring mastery in careful and relevant history taking, physical examination in clinical evaluation of the patient preoperatively.
  - ❖ Collecting and synthesizing preoperative data from parent hospital and other sources and to develop a rational strategy for the peri-operative care of the patient.
  - ❖ Thorough and systematic approach to preoperative evaluation of patients with and without systemic diseases, undergoing different types of operations.
  - ❖ Prioritizing problems, present cases clearly and systematically to attending consultants.
  - ❖ Developing working relationships with consultants in other specialties to assist in preoperative evaluation and get a good consultation.
  - ❖ Interacting with preoperative patients and developing effective counseling techniques for different anaesthetic techniques and peri-operative procedures.
  - ❖ Assessing and explaining risk of procedure and taking informed consent.
  - ❖ Managing information in preoperative evaluation and outcome enhancement and communication skill to patients and relatives.
  - ❖ Ability to choose and order the required investigations to be done in a particular patient peri operatively

- Demonstrate ability in performing
  - ❖ Pre-operative equipment check
  - ❖ selection of drugs
  - ❖ Preparation of work table etc.

- Identify conditions like difficult airway by following difficult airway algorithms.
- Demonstrate ability to establish topical airway anaesthesia for awake intubation
- Demonstrate management of a Failed intubation drill on a Mannequin according to latest guidelines
- Demonstrate ability to monitor and assess depth of anaesthesia
- Demonstrate abilities to manage body fluid composition; volume status; replacement of fluid and blood loss; use of whole blood and blood components.

- Demonstrate abilities to manage Electrolyte and acid base derangements; osmolarity and osmolality.
- Demonstrate acquisition of skills to initiate mechanical ventilation; select appropriate type and mode of ventilator; and monitor proper functioning of ventilator.
- Identify the need to perform intra-operative laboratory tests, blood gases, coagulation profile and interpret the results with clinical co relation
- Demonstrate ability to manage co-morbid conditions and anaesthesia
- Demonstrate ability to perform cannulation of arteries, central and peripheral veins.
- Demonstrate ability in using and interpreting the following routine non-invasive and invasive monitors intra-operatively:
    a. Electrocardiogram with ST-segment analysis
    b. Noninvasive blood pressure
    c. Capnograph: values and changes in values and waveform.
    d. Pulse oximetry: values and changes in values
    e. Neuromuscular blockade monitor
    f. Invasive arterial pressure: waveform and changes in the waveform
    g. Central venous pressure: values and waveform
    h. Pulmonary artery pressure: Values and waveforms, pulmonary capillary wedge tracing.
        i) Cardiac output
        ii) Mixed venous oxygen saturation
        iii) Evoked potential
        iv) Transesophageal echocardiography: basic understanding

- Demonstrate skills in providing basic life support, advanced cardiac life support, trauma life support and paediatric-neonatal life support, train medical and paramedical staff in BLS and ALS.
- Demonstrate mastery in common procedures like vascular access, use of latest invasive and non-invasive monitoring equipment, lumber puncture, management of appropriate mechanical ventilation and total care of Intensive Care Patient.
- Demonstrate ability to administer general anaesthesia and regional anaesthesia for ASA I to V, under supervision.
- Demonstrate ability to give extradural block (EDB) lumbar and thoracic, Spinal Block, and Peripheral Nerve Blocks under supervision.
- Demonstrate ability to use ultrasound machine for giving blocks and venous cannulation.
- Demonstrate ability to plan and administer anaesthesia to all emergency patients under supervision including patients for Cardiac, Neurosurgery, Pediatric surgery,

and for all major surgeries, able to manage critically ill patients and treat intractable pain.

- Demonstrate following abilities in **Emergency Anaesthesia, Trauma and Resuscitation:**
  - ❖ Organize resources in case of mass casualty.
  - ❖ Perform triage.
  - ❖ Assess, transport and manage mass casualties / disaster management and camp anaesthesia.
  - ❖ Manage massive haemorrhage and massive blood transfusion.
  - ❖ Transport critically ill patient.
  - ❖ Perform anaesthetic management of geriatric patients with fracture neck of femur
  - ❖ Manage severe burns patients, rapidly progressing spinal compression, massive haemoptysis and lobectomy, peritonitis from various suspected causes, preparation and management of bowel obstruction, septicaemic shock, acute upper airway obstruction such as foreign body, epiglottitis, infections, cardiac tamponade from examples post cardiac surgery, malignant pericardial effusion, peri-operative management of rupture aneurysm of abdominal aorta
  - ❖ Basic Cardiac Life Support and Advanced Cardiac Life Support, Basic Trauma Life Support, Advanced Trauma Life Support, and Cerebral preservation.
  - ❖ Management of intra-operative cardiac arrest
  - ❖ Management of intra-operative bronchospasm

- Demonstrate ability to document a Medico-legal aspect.
- Demonstrate ability to provide special sedation /**anaesthesia requirements outside operating Room,** eg **Radiology**: for CT, MRI (especially in relation to dye allergy and embolization, **Oncho radiotherapy**, **Electroconvulsive shock therapy** (modified ECT. **Non-invasive cardio-radiologic procedures** including balloon angioplasty and cardiac catheterization, **Non-invasive neuro-radiologic procedures, lithotripsy** etc **.**
- Demonstrate ability to analyze data and write a thesis, present scientific data, participate in anaesthesia audit.
- Demonstrate ability to critically review and acquire relevant knowledge from the journals about the new development in the specialty
- Demonstrate following abilities in the **Post Anaesthesia Care Unit (PACU)**
  - ❖ Assess the patient's recovery and condition for a safe discharge or transfer.
  - ❖ Observe, recognize and treat the commonly occurring problems likely to arise in the Post-anaesthsia Care Unit (PACU) especially those in relation to cardio-respiratory systems:
    1. Airway integrity and compromise.

2. Arrhythmia
3. Hypertension
4. Hypotension
5. Pain prevention and pain relief
6. Nausea and vomiting
7. Decreased urine output
8. Emergence delirium
9. Delayed emergence from anaesthesia
10. Shivering
11. Post-obstructive pulmonary edema.

- ❖ Assess patient recovery and the parameters for transfer from the PACU to the ward, ICU, home.
- ❖ Score the patient's condition according to the Aldrete system, including fast tracking after out-patient surgery.

- Demonstration of following abilities in **Intensive Care Unit**
  - ❖ **Understanding the spectrum of critical illnesses requiring admission to ICU.**
  - ❖ Recognizing the critically ill patient who needs intensive care -Trauma, burns, all types of shock, Sepsis, SIRS and ARDS, Poisoning, infectious patient (HIV, Hepatitis) and patients with metabolic disturbances.
  - ❖ Monitoring progress of patients by physiological scoring systems
  - ❖ Practicing infection control practices and control of nosocomial infections.
  - ❖ Inserting central venous lines, arterial lines using ultrasound and interpreting the data.
  - ❖ Managing cardiovascular instability, respiratory failure and postoperative pulmonary complications
  - ❖ Understanding of the operation of mechanical ventilators including different ventilatory modalities non-invasive ventilation, complications and modes of weaning.
  - ❖ Principles and application of Oxygen Therapy
  - ❖ Glycemic control in the critically ill patient
  - ❖ Practice of Hypothermia and prevention of cerebral injury after cardiac arrest
  - ❖ Delivering appropriate nutritional support - enteral and parenteral.
  - ❖ Proper use of sedative/hypnotic drugs in the ICU.
  - ❖ Practicing ethical and legal aspects of critical care
  - ❖ Good communication skills with patient and relatives.
  - ❖ Proper Sterilization of ICU equipment.

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- Demonstration of following abilities in **Acute and Chronic Pain Management**
  - ❖ Assessment of patients with pain including: history taking, physical examination, and interpretation of investigations.
  - ❖ Classify types of pain - acute chronic, traumatic, cancer pain, etc. with the knowledge of Pain pathways in detail.
  - ❖ Practice the different modalities of physical therapy that may relieve both acute and chronic pain
  - ❖ Practice the acute pain, cancer pain guidelines and WHO treatment ladder.
  - ❖ Practice routes of administration and risk/benefits of drugs used for acute and chronic pain relief, patient controlled analgesia and treat the common pain syndromes.
  - ❖ Demonstrate practice of pain management in patients with problem drug use, drug dependency and addiction and identify the parameters for referral to a pain medicine specialist.
- Demonstrate Organization of acute pain service and role of acute pain nurse for pain assessment in various groups of patients, Physiological changes secondary to Pain, practice different modalities of pain control. Pharmacology and side effects of opioid analgesia and non-opioid analgesia, principle of patient-controlled analgesia and assessment of its efficacy, Pharmacology and side effects of epidural/intra-thecal opioid. Neurological assessment of epidural blockade and management of failed block. Management of regional blockade – brachial plexus, para-vertebral and intra-pleural block. Management of epidural abscess. Substance abuse and acute pain control. Pain control in concurrent medical diseases – COAD, IHD, bleeding tendency, geriatric. Pain control in burns patients. Pain control in trauma patients included multiple rib fracture
- Demonstration of abilities to manage **Chronic Pain**
  - ❖ Practice different modalities of chronic pain management - physical therapy, psychotherapy, (including cognitive behavioural approaches), neuro-ablation, neuro-augmentation, spinal opioid, interventional neuro-blockade, non-opioid analgesia.
  - ❖ Anatomy, indication, technique and complication of chemical sympathectomy (lumbar sympathectomy, stellate ganglion block, celiac plexus block).
  - ❖ Practice principles of management of cancer pain, principle of management of non-cancer neuropathic pain - phantom limb pain, post-herpetic neuralgia, complex regional pain syndrome, trigeminal neuralgia. Principle of management of non-cancer nociceptive pain - myofascial pain, lower back pain, intractable angina, burns, chronic pancreatitis, PVD.
  - ❖ Practice Epidural steroid injection (all levels) and long-term epidural catheterization.
  - ❖ Observe and practice following blocks: Infra-orbital nerve, Intercostal nerve

- ❖ Recognize complications associated with each blocks and know appropriate treatment of each
- ❖ Know the indications for stimulation techniques such as transcutaneous electrical nerve stimulation (TENS), dorsal column stimulation, and deep brain stimulation.
- ❖ Mechanisms and side effects of other therapies used for treating pain.
- ❖ The principles of pain management in special patient groups including the elderly, children, disabled, intellectually handicapped and those unable to communicate.
- ❖ Awareness of the principles for insertion and management of implantable drug delivery pumps.
- ❖ Awareness of the basic principles of palliative care.

- **Demonstrate practice of Regional Anaesthesia**
  - ❖ Applying general principles of pharmacology of local anaesthetics and various adjuvants.
  - ❖ Familiarizing with the relevant anatomy for regional techniques.
  - ❖ Application of indications and contraindications to regional anesthetic technique including central neuraxial blocks, peripheral nerve blocks and sympathetic nerve blocks.
  - ❖ Assessing adequacy of regional anaesthesia, and learn techniques of supplementation of inadequate blocks.
  - ❖ Providing effective anxiolytics and sedation of patients by both pharmacologic and interpersonal technique.
  - ❖ Performing the following regional anaesthesia techniques:
    - o Brachial plexus, cervical plexus, stellate ganglion block, lumbar plexus, lumbar sympathetic, Sciatic nerve block, Femoral nerve block, 3 in 1 block, Wrist block, Popliteal Nerve block, Trigeminal nerve block, Retro bulbar blocks, Paravertebral blocks, Intercostal blocks, Caudal block – adult and pediatric, Ankle block, Epidural block/Catheter, Subarachnoid block, Bier's block, All peripheral nerves of the upper and lower limbs.

- **Demonstrate practice of Thoracic Anaesthesia**
  - ❖ Pre-operative assessment of patients undergoing Thoracotomy (lung resection), thoracoscopy, video assisted thoracoscopy and mediastinoscopy
  - ❖ Various approaches and their relevant equipments for lung isolation.
  - ❖ Various double lumen tubes and their placement.
  - ❖ Application of Principle of chest drain.
  - ❖ Respiratory Physiology and management of one lung ventilation (OLV). Indications, contraindications and hazards of OLV.

- ❖ Application of the knowledge of Anatomy of lung and broncho-pulmonary segments.
- ❖ Anatomy and techniques for intercostals nerve block and thoracic epidural. Management of thoracic epidural anaesthesia and analgesia
- ❖ Anatomy, techniques and placement of paravertebral block/catheter.
- ❖ Post-operative care of patients after lung surgery.
- ❖ Peri-operative management of patients with myasthenia gravis.
- ❖ Peri-operative management of patients with mediastinal mass.
- ❖ Anaesthetic management of mediastinoscopy, major airway stenting.
- ❖ Lung volume reduction surgery and problems.

- **Demonstrate practice of Cardiovascular Anaesthesia**:

  - ❖ Application of the knowledge of Anatomy and physiology of valvular disease, coronary arteries and their territories. Pulmonary circulation, coronary circulation, cerebral circulation, visceral circulation.
  - ❖ Application of the knowledge of Distribution of blood volume to different organs and systems and their control. Microcirculation. Venous system, venous pressure, its influence on various functions.
  - ❖ Regulation of blood pressure, hypotensive anaesthesia.
  - ❖ Anatomy and physiology of all operable congenital heart disease like ASD, VSD, PDA, TOF, transposition of great vessels.
  - ❖ Application of the knowledge of anatomy and physiology of vascular heart disease like co-arctation of aorta.
  - ❖ Assessment of cardiac patient with ischaemic heart, valvular heart disease and other diseases listed above. Understanding of cardiac catheterization, echocardiography, stress testing, and radio-nucleide imaging.
  - ❖ Application of Principle and complication of cardiopulmonary bypass
  - ❖ Application of Principle of trans-esophageal echocardiography
  - ❖ Application of Principle of circulatory support: inotropes, IABP, pacing
  - ❖ Coagulation and management of coagulopathy.
  - ❖ Off pump bypass
  - ❖ Intra-operative management of aortic surgery and major peripheral vascular surgery, aneurysm grafts, recanalisation procedures.
  - ❖ Understanding of the adult patient with congenital heart disease and their management during anaesthesia.
  - ❖ Postoperative cardiac critical care, including cardiovascular problems, analgesia.
  - ❖ Insertion of invasive monitoring for arterial monitoring, central venous pressure monitoring, pulmonary artery catheter insertion and interpretation.
  - ❖ Robotic cardiac surgery.

- **Demonstrate practice of Paediatric Anaesthesia**
  - ❖ Application of knowledge of Anatomical changes in paediatric patient and neonates.
  - ❖ Application of knowledge of Physiology and pharmacology in paediatric patient.
  - ❖ Guideline for pre-operative fasting in children and pre-medication.
  - ❖ Anaesthetic equipment: laryngoscopes, airways, endotracheal tubes, LMAs, PLMA and breathing circuit for children.
  - ❖ Anaesthesia management for premature and newborn.
  - ❖ Emotional problems for parent and child and principles of premedication. Consent by parents and their presence during induction. To become skilled in communicating with children, parents and other relatives.
  - ❖ Problems of transporting a sick pediatric patient from the ward to the operating room and back with regard to temperature maintenance, cardiovascular stability, ventilation and oxygenation.
  - ❖ Estimate preoperatively blood volume, hourly fluid requirements, fluid deficit, third space loss, acceptable blood loss and apply principles of fluid and blood replacement in the perioperative period.
  - ❖ Induce and maintain anaesthesia by inhalation, intravenous, intramuscular and rectal routes and monitor pediatric patients.
  - ❖ Understand the benefits, risks and techniques of regional anaesthesia in children. Anatomy and techniques of caudal, dorsal penile and inguinal regional block, spinal and epidural block
  - ❖ Learn to recognize and treat post anaesthesia complications like apnea, laryngospasm, acid-base and electrolyte disturbances, febrile and convulsing child and bleeding child.
  - ❖ Common problems related to common congenital syndromes presenting for surgery. Anaesthetic management of a child with concurrent disease – Down's, Pierre Robin syndrome, von Willebrand's disease, Goldenhar's, Sturge-Weber, Tracher-Colin, Prune-Belly, and cyanotic and non-cyanotic congenital heart disease.
  - ❖ Paediatric resuscitation: drugs, doses and defibrillation of children of all ages, from the very premature neonates to those children with complex coexisting disease.
  - ❖ Management of patients requiring paediatric intensive care, ventilatory management, and support of circulation.
  - ❖ Resuscitation of neonates and children of all ages. A period of one to two months in a PICU is recommended for all post graduate students undergoing advanced training in paediatric anaesthesia.
  - ❖ Paediatric pain management
  - ❖ Assessment of a child with URTI, with a heart murmur.
  - ❖ Management of fluid and electrolytes in children.

- ❖ Anaesthetic management of a malignant hyperthermia susceptible child.
- ❖ Anaesthetic management of FB bronchus, oesophagus, Wilm's tumour, congenital diaphragmatic hernia, tracheo-oesophagus fistula, thoracotomy.
- ❖ Anaesthesia for Fetal Surgery.
- ❖ Sedation techniques including the selection, management and monitoring of children for diagnostic and therapeutic procedures, with particular attention to working in areas outside the theatre suite.

- **Demonstrate practice of Transplant anaesthesia**
  - ❖ Application of knowledge of basic pathophysiology of renal and liver failure. Principles of anesthetizing an immuno-compromised patient.
  - ❖ Principles of anesthetizing patient with end stage renal/liver disease and patient with organ transplantation. Perioperative management.
- **Demonstrate practice of Neuroanaesthesia**
  - ❖ Application of basic knowledge of cerebral circulation and intra cranial pressure and its implications
  - ❖ Anaesthesia to patients with neurologic disease, head injury undergoing neurologic or non-neurologic surgery and for diagnostic procedures requiring anaesthesia.
  - ❖ Anesthetic implications of the most common neurosurgical procedures, transnasal, trans-sphenoidal pituitary surgery. Posterior fossa surgery. Surgery for supratentorial pathology.
  - ❖ Application of basic concepts behind electrophysiologic monitoring of the brain and spinal cord.
  - ❖ Application of knowledge of general principles of positioning the patient for surgery and the advantages and disadvantages of each position.
  - ❖ Effects of anaesthesia on the electroencephalogram (EEG) and evoked potentials.
  - ❖ Differential diagnoses and treatment alternatives of intraoperative intracranial hypertension ("tight brain")
  - ❖ Management of Head Trauma, and its anesthetic management and various protocols regarding their management and associated trauma.
  - ❖ Intracranial surgery and spinal surgery, both routine and emergency.
  - ❖ Monitoring: techniques for detection and management of air embolism.
  - ❖ Lumbar puncture and CSF drainage.
  - ❖ Non-surgical management of the head trauma patient, Systemic complications of severe brain injury.
  - ❖ Management of subarachnoid haemorrhage and vasospasm.
  - ❖ Diagnosis and management of patients with brainstem death; and dealing with patient's relatives

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- **The following are special procedures which the post graduate student must be able to perform**

Sr. No.	**Name of procedure**
1.	Blind Nasal intubation
2.	Failed intubation drill (includes Fiberoptic Laryngo/ Bronchoscope)
3.	Double Lumen Tube
4.	Bronchial Blocker placement
5	Jet Ventilation
6.	Suctioning and physiotherapy of wet lung
7.	Intubation in Neonates
8.	Initiation and management of ventilation
9.	Combined Spinal Epidural
10.	Brachial Plexus Block
11.	Intravenous Regional Anaesthesia
12.	Elbow, Wrist, Digital, Sciatic, Femoral, Lateral Cutaneous Nerve of thigh, Ankle - each
13	Cervical-Superficial and Deep, Stellate, Splanchnic - each
14.	Central Venous Line by Brachial, Jugular and Subclavian veins
15.	Radial and Femoral Artery cannulation
16.	CVP monitoring
17.	Pulmonary Capillary Wedge Pressure
18.	Neuro-muscular transmission Monitoring
19.	Anaesthetic Depth eg. BIS monitoring

- Demonstration of anesthetic abilities in the intraoperative period keeping into consideration the specific requirement of the surgical procedure – ENT, Orthopaedic, Gynaecology – Obstetrics, General surgery, Onchosurgery, replacement surgeries, urosurgery, vascular, plastic, Thoracic, Dental etc

Suggested Time Frame for Training the PG Students:

The student should be taught as per the following schedule to acquire the skills:

1. **First 6 months:**
   - During the first 6 months, the student should be taught expertise in the management of uncomplicated cases not belonging to any super specialty (ASA I and II cases). To start with, the student will observe and slowly become independent in giving general anaesthesia and spinal aneasthesia to ASA I and II cases for minor and major surgery, under graded supervision.
   - The postgraduate student should learn the basic principles of safe and effective anaesthesia, resuscitation, and both the prevention and treatment of pain,

perioperative care of the surgical patient, care of handling equipments, basic techniques in anaesthesia, and anaesthetic pharmacology, and electrical safety.

- He/she should select the thesis topic and submit the protocol for his thesis.

2. Next 18 months

- The student should widen his experience and should be able to undertake anaesthetic care of all routine cases, assist in the anaesthetic care for routine obstetric practice, understand basic principles of critical care, pain management, and participate in audit.
- The student should be trained in administration of general anaesthesia and regional anaesthesia for ASA I to V under supervision. The student should be able to give extradural block (EDB) lumbar and thoracic, Spinal Block, and Peripheral Nerve Blocks under supervision, and use of Ultrasound machine for giving blocks and venous cannulation. The student should learn paediatric and trauma life supports and maintain skills for basic and advanced cardiac life support.
- It is advised that they should be posted in the following specialties: general surgery including gastrointestinal surgery, transplant, ENT, Urology, Obstetrics, Dental Surgery, Eye, ICU, Pain Clinic and peripheral theatres like ECT, radiodiagnostic and therapeutic procedures (CT scan, MRI scan, angiography).
- The student should be able to analyze data and write a thesis. He/she should be able to present scientific data.

3. Last 12 months

- Thesis should be submitted minimum of 6 months before the final MD examination.
- The post graduate student should be given experience of various super-specialties like cardiothoracic and vascular surgery, neurosurgery and transplantation, and paediatric surgery. The student should be able to plan and administer anaesthesia to all emergency patients under supervision including patients for Cardiac, Neurosurgery, Pediatric surgery, and for all major surgeries. The aim at the end is to be competent and independent soon after the third year of junior residency in providing anaesthesia to elective and emergency cases.
- The post graduate student should be able to manage critically ill patients and treat intractable pain. They should also know how to organize resources in case of mass casualty. The curriculum should be able to provide 04 months of elective Intensive Care Unit posting (2 months during initial years under supervision and 2 months independently in the last six months).

4. At the end of 3 years, the post graduate student should have the skills to:

- Plan and conduct anaesthesia and provide post-operative care including pain relief for elective and emergency surgical procedures related to all surgical specialties.

- Carry out basic life support (BLS) and advanced life support (ALS) and train medical and paramedical staff in BLS and ALS.
- Manage patients admitted to an intensive care unit with the help of latest equipment.
- Manage patients suffering from acute and chronic intractable pain.
- Organize the hospital environment to manage mass casualty situation and camp anaesthesia.
- Critically review and acquire relevant knowledge from the journals about the new development in the specialty.
- Should be able to participate in anaesthesia audit.

Overall the student should acquire skills in the following practical competencies:

- ❖ Information management in preoperative evaluation and outcome enhancement and communication skill to patient and relatives.

Syllabus

The course content of **1st year** should cover the following:

1. **Anatomy related to:**
    - Diaphragm, upper and lower airway
    - Regional anaesthesia, field block, central neuraxial, blockade, block for acute pain states
    - Intramuscular injections, arterial and venous cannulations and positioning.
2. **Physics related to:**
    - Anaesthesia machine - assembly of necessary items.
    - Airway equipment including laryngoscopes, airway devices
    - Breathing systems
    - Monitoring in anaesthesia with concepts of minimum monitoring
    - Gas laws, medical gas supply system
    - Fluidics
    - Electricity and diathermy
    - Oxygen therapy
3. **Physiology related to:**
    - Theories of anaesthesia
    - Respiratory, cardiovascular, hepatobiliary, renal and endocrine system, pregnancy, blood, muscle and N-M junction, Nerve impulse transmission, ECG, regulation of temperature and metabolism, stress response, cerebral blood flow and ICP.

- Central, autonomic and peripheral nervous systems.
- Metabolic response to stress and trauma.

4. **Pharmacology related to**

    - General principles, concepts of pharmacokinetics and pharmacodynamics
    - Drug interactions in anaesthesiology, anaphylactoid reactions
    - Drugs used for premedication, induction of anaesthesia, general anaesthetics- intra-venous and inhalational, neuromuscular block and reversal of muscle relaxants.

5. **Biochemistry** relevant to fluid balance and blood transfusion, perioperative fluid therapy, acid base homeostasis in health and diseases.
6. Theoretical background of the commonly used anaesthetic techniques of general and regional anaesthesia, general principles of pre-anesthetic assessment and medication, recovery from anaesthesia and post operative care, effects of positioning during anaesthesia.
7. Introduction to the operation theatre, post-anaesthesia care rooms
8. Introduction to acute, chronic pain and pain management.
9. Documentation and medico-legal aspects of anaesthesia. Defensive anaesthesia. Concept of informed consent.
10. Resuscitation - basic and advanced life support (cardiac and trauma life support), neonatal resuscitation.
11. Intensive care of critical patients with introduction to artificial ventilation, management of unconscious patients, oxygen therapy, shock - pathophysiology and management.
12. Introduction to Research methodology, basics of biostatistics.

The course content of **2nd year** should cover the following:

Anatomy related to blocks for chronic pain, chemical neurolysis and different organ systems.

1. **Physics related to:**
    - equipments used in anaesthesia monitors, ventilators, vaporizers,
    - fibroptics.
    - Laser
    - Pacemaker and defibrillator
    - Monitoring equipment used for assessment of cardiac functions, temperature, respiratory functions, blood gases, intracranial pressure, depth of anaesthesia and neuromuscular block.
    - Sterilization of equipment
    - Computers in anaesthesia

2. Pharmacology of drugs used in cardiovascular, respiratory, endocrine, renal diseases and CNS disorders.
3. Interpretation of blood gases and other relevant biochemical values, various function tests and basics of measurement techniques, ECG.
4. Blood coagulation mechanism, disturbances, blood components.
5. Special anaesthetic techniques as relevant to –

    - Outpatient anaesthesia, hypotensive anaesthesia, anaesthesia in abnormal environments including rural area and calamitous situations
    - Associated medical disorders in surgical patients

6. Geriatric and pediatric anaesthesia
7. Emergency, ENT, orthopedic, ophthalmology, obstetrics, dental, radio-diagnosis and radiotherapy.
8. Medical statistics relevant to data collection, analysis, record keeping in anaesthesia, comparison and estimation of significance.
9. Care of terminally ill, Hospices management. Do not resuscitate orders.
10. Postures and anaesthesia.
11. Induced hypothermia, incidental, environmental safety of patient.
12. Malignant hyperthermia, myasthenia gravis, GB syndrome and other neuromuscular diseases, obesity, COPD, Diabetes mellitus, bronchial asthma and hypertensive crises..
13. Third world anaesthesia.
14. Inherited metabolic diseases and anaesthesia.

The course contents of **3rd year** should cover the following:

1. Principles of anaesthetic management of neuro/cardiac/thoracic/vascular/ transplantation/burns and plastic surgery.
2. Anaesthesia for patients with severe cardiac, respiratory, renal and hepatobiliary disorder posted for unrelated surgery
3. Shock, types, pathogenesis and management of patients in shock, renal failure, critically ill and/or on ventilator.
4. Multiple organ failure
5. Infection control, cross contamination in OT and ICU.
6. Immune response and anaesthesia.
7. Concept of cytokines, and other enzymes.
8. Selection, maintenance and sterilization of anaesthesia and related equipment
9. Chronic pain therapy and therapeutic nerve blocks.
10. Acupuncture, acupressure and other non-conventional methods of treatment.
11. Principles of neonatal resuscitation, ventilation and critical care.
12. Principles of human resources and material management.

13. General principles of medical audit. Critical incident reporting
14. Ethics and clinical trial.
15. Hospital, ICU and OT design and planning.
16. Medical education including evidence based medical education.

TEACHING AND LEARNING METHODS

Postgraduate Training

Teaching methodology

Didactic lectures are of least importance.

- Teaching should include seminars, journal clubs, symposia, tutorials, case discussions, and research presentations.
- Reviews and guest lectures should get priority for theoretical knowledge.
- Bedside teaching, grand rounds, interactive group discussions and clinical demonstrations should be the hallmark of clinical/practical learning.
- Student should have hands-on training in performing various procedures (medical/surgical concerning his specialty) and ability to interpret various tests/investigations.
- Exposure to newer specialized diagnostic/therapeutic procedures concerning his/her subject should be given.
- A postgraduate student of a postgraduate degree course in broad specialities/super specialities would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.
- Log books shall be maintained regularly and should be checked and assessed periodically by the faculty members imparting the training.
- The postgraduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.
- Department should encourage e-learning activities.

Thesis: Supervision

- The postgraduate is responsible to a Faculty member and the latter should be available to advise and assist the student in his clinical assignments
- Departmental teaching committee will be responsible for the educational activities of the department and the teaching schedule.
- This involves providing services for emergencies and it makes different demands upon the anaesthesiologist. It should be learned through experience, with reduced staff. The clinical work during emergency should have a close supervision. The standards should be maintained of the agreed competence on schedule. The

emergency duties should be properly arranged with duty off. The postgraduates may have to do emergency duty as per schedule

During the training programme, patient safety is of paramount importance; therefore, skills are to be learnt initially on the models, later to be performed under supervision followed by performing independently; for this purpose, provision of skills laboratories in medical colleges is mandatory.

Simulators:

Simulators should be used for the events of high importance but infrequent occurrence and where there may be high risks to the patients. The simulators can also be used for assessment purposes.

Rotation:

Schedule for three years of MD Anaesthesia postings:

The post graduate student should be exposed to the following areas of clinical anaesthesia practice:

1. Pre-anaesthesia clinic
2. Pain clinic
3. Recovery and Post anaesthesia Care Unit (PACU)
4. Intensive Care Units
5. Dialysis and transplant
6. All specialty theatres
7. Peripheral areas: Radiology, MRI, ECT and other interventional laboratories

The suggested schedule of the Operating Theatre can be as follows: This may change as per availability of specialities.

Operation theatre	**Months**
General Surgery	6
Urology	1
Ophthalmology	1
Otorhinology	2
Dental	1
Orthopedics/Trauma/casualty	3
Gynecology	3
Obstetrics	3
Pediatrics surgery	2
Burns/Plastic	1
CTVS	2
Neurosurgery	2

ICU	4
Pain	1
Recovery	1
Organ Transplant posting in the other areas. ECT, Cardiac Cath)	(Radiology,Radiotherapy)

ASSESSMENT

FORMATIVE ASSESSMENT, during the training programme

Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self directed learning and ability to practice in the system.

General Principles

Internal Assessment should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills. The Internal Assessment should be conducted in theory and clinical examination. The thesis is assessed separately.

Quarterly assessment during the MD training should be based on:

1. **Journal based / recent advances learning**
2. **Patient based /Laboratory or Skill based learning**
3. **Self directed learning and teaching**
4. **Departmental and interdepartmental learning activity**
5. **External and Outreach Activities / CMEs**

The student to be assessed periodically as per categories listed in postgraduate student appraisal form (Annexure I)

SUMMATIVE ASSESSMENT ie., assessment at the end of training

The summative examination would be carried out as per the Rules given in **POSTGRADUATE MEDICAL EDUCATION REGULATIONS, 2000.**

Post graduate Examination

The examinations shall be organised on the basis of 'Grading'or 'Marking system' to evaluate and to certify post graduate student's level of knowledge, skill and competence at the end of the training. Obtaining a minimum of 50% marks in 'Theory' as well as 'Practical' separately shall be mandatory for passing examination as a whole. The examination for M.D./ MS shall be held at the end of 3rd academic year. An academic term shall mean six month's training period.

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The final examination consists of three parts:

1) Thesis
2) Theory evaluation
3) Practical/Clinical and Oral evaluation

1. Thesis

Every post graduate student shall carry out work on an assigned research project under the guidance of a recognised Post Graduate Teacher, the result of which shall be written up and submitted in the form of a Thesis. Work for writing the Thesis is aimed at contributing to the development of a spirit of enquiry, besides exposing the post graduate student to the techniques of research, critical analysis, acquaintance with the latest advances in medical science and the manner of identifying and consulting available literature.

Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination. The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination. A post graduate student shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners.

2. Theory consists of four papers of 3 hours each having 10 short structured questions with 10 marks each:

Paper I: Basic Sciences as applied to Anaesthesiology

Paper II: Practice of Anaesthesia: Anaesthesia in relation to associated systemic and medical diseases.

Paper III: Anaesthesia in relation to subspecialties/superspecialties

Paper IV: Intensive Care Medicine, Pain Medicine and Recent advances.

3. Practical/Clinical Examination: will consist of: 3 clinical cases,

Long case: One, duration 30 min (history, examination, Diagnosis and Management, Discussion)

Short cases: Two, 15 minutes each for short case. In short cases only relevant history important to anaesthesia to be taken (history, clinical examination and diagnosis, discussion).

Oral/Viva-voce should be conducted preferably on four tables with one examiner on each table:

Table one: ECG, X-rays, ABG Cards, Pulmonary function tests, Capnographs, clinical exercises card. Table two: Anaesthetic Drugs, Emergency Drugs, IV Fluids, Nerve Bocks (skeleton) .

Table three: Anaesthesia machine including circuits and Vaporizers, ETT, Supraglottic Airway devices, ICU Ventilator and oxygen therapy equipment.

Table four: Resuscitation equipments, resuscitation demonstration, Difficult Airway Equipment, monitoring equipments.

Alternatively,

1. One long case, viva voce at one station with all examiners, and : 150 marks
2. 28 OSCE station covering two stations of short cases, drugs ECG, X-rays, PFT, ABG, Respiratory loops, Resuscitation etc.,: 150 marks

Recommended Reading

Books (latest edition)

1. Lee's Synopsis of Anaesthesia
2. Clinical Anesthesiology by Morgan
3. Cardiac Anaesthesia By Joel Kaplan
4. Clinical Anaesthesia by Barash, Cullen and Stoelting
5. Textbook of Anaesthesia by Aitkenhead Rowbotham and Smith
6. Anaesthesia for neonates and infants by Smith
7. Pharmacology and Physiology for Anaesthetists by Stoelting
8. Principles of Obstetric Anaesthesia by Craford
9. Miller's Anesthesia
10. Stoelting RK, Miller RD Basics of Anaesthesia
11. ICU Book, Paul Marino
12. Text Book of Critical Care, by Fink et al
13. Regional Anaesthesia, P Prithviraj
14. Practical Management of Pain, Raj
15. Stoelting and Dierdorf: Anaesthesia and Co-existing Disease
16. Dorsch and Dorsch: Understanding Anaesthesia Equipments
17. ECG by Shamroth/Goldman
18. Anatomy for Anaesthetists by Harold Ellis
19. Clinical Anesthesia by P.G.Barash
20. Longneckers Anaesthesiology- Mcgraw Hill

Must refer:

1. Cucchiara and Michenfelder: Clinical Neuroanaesthesia
2. Cottrell and Smith: Anaesthesia and Neurosurgery
3. Complications in Anaesthesiology by Orkin
4. Complications in Anaesthesia by Raven
5. Airway management by JL Benumof
6. Obstetric Anaesthesia by Chestnut

Journals

03-05 international Journals and 02 national (all indexed) journals

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Annexure I

Postgraduate Students Appraisal Form
Pre / Para /Clinical Disciplines

Name of the Department/Unit :

Name of the PG Student :

Period of Training : FROM……TO……

Sr. No.	PARTICULARS	Not Satisfactory	Satisfactory	More Than Satisfactory	Remarks
		1 2 3	4 5 6	7 8 9	
1.	Journal based / recent advances learning				
2.	Patient based /Laboratory or Skill based learning				
3.	Self directed learning and teaching				
4.	Departmental and interdepartmental learning activity				
5.	External and Outreach Activities / CMEs				
6.	Thesis / Research work				
7.	Log Book Maintenance				

Publications **Yes/ No**

Remarks*_____
_____
_____
____

***REMARKS: Any significant positive or negative attributes of a postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.**

SIGNATURE OF ASSESSEE **SIGNATURE OF CONSULTANT** **SIGNATURE OF HOD**

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NATIONAL MEDICAL COMMISSION
Postgraduate Medical Education Board

D 11011/1/22/AC/Guidelines/24 **Date: 16-11-2022**

National Medical Commission

GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR MD IN BIOCHEMISTRY

GUIDELINES FOR COMPETENCY-BASED POSTGRADUATE TRAINING FOR MD IN BIOCHEMISTRY

Preamble

A competency is the capability to apply or use a set of related knowledge, skills, and abilities required to successfully perform "critical work functions" or tasks in a defined work setting. Competency-based training is a learning model in which the required level of knowledge and skill (competency) on a task must be demonstrated. The purpose of the competency-based postgraduate education in Biochemistry is to create specialists, with the required knowledge, skills, and attitude, who would provide high-quality healthcare complying with the principles of personal integrity and professional ethics and would advance the cause of science through teaching, research & training along with constant updating of his/her knowledge and skills as a lifelong self-directed learner.

The student, after undergoing training in MD Biochemistry, should be able to demonstrate his/her knowledge of the basic concepts and recent advances in the subject, and a defined set of skills including expertise in various laboratory techniques applicable to metabolic and molecular aspects of medicine, planning and executing research projects, writing research papers/ articles demonstrating the acquired training in research methodology. The postgraduate training course should equip the student with skills to become a competent teacher who is also able to demonstrate his/her competence in planning teaching programs and apply those to facilitate the learning of the students in medical and allied health science courses in compliance with the curriculum while advancing the same with needful and feasible innovations. He/she should demonstrate competence in integrating teaching-learning of Biochemistry with other relevant subjects/disciplines to facilitate the holistic application of the subject of Biochemistry in patient care. He/she should be able to demonstrate his/her training in good laboratory practices with the ability to set up/manage a quality-controlled and quality-assured diagnostic laboratory, generate, evaluate, interpret and report the diagnostic laboratory data, with a good understanding of the sources of errors,

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corrective and preventive actions, hospital and laboratory information system network, and interact with clinicians as may be needed for effective patient care.

This document aims to provide teachers and learners with comprehensive guidelines to achieve a defined set of outcomes through learning and assessment and apply those in a given setup. This document has been framed by the Expert Group of the National Medical Commission with an aim to render a uniform PG medical curriculum to be implemented by all the medical colleges in the country. The curriculum so designed has been named the competency-based PG medical education curriculum in conformity with the purpose and content of PG medical education.

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SUBJECT-SPECIFIC LEARNING OBJECTIVES

Goal:

The goal of the training program in MD Biochemistry is to enable a student to become a competent teacher/facilitator of teaching-learning processes, researcher, problem solver, and healthcare provider. He/ she should be able to acquire a defined set of cognition and skills as detailed below and demonstrate his ability to apply the same in a given healthcare setup.

a. Acquisition of Knowledge

The student should be able to explain the molecular, physical, and physiological logic of the processes involved in the maintenance of normal health and their deviation in a disease state. He/should be able to integrate his/her acquired knowledge in principles and concepts of classical biochemistry, biophysics, and molecular biology, comprehend and apply his/her cognition and skills in a professional patient care setup.

b. Acquisition of Skills

The student should be able to facilitate the UG and PG learning of biochemical concepts and principles and should be able to render hands-on training in the Biochemical laboratory investigations and experimentations relevant to the strengthening of biochemical concepts, scientific and clinical problem-solving, and biomedical research. He/she should be able to

analyze, interpret and evaluate the data, and rationalize their application in clinical management and experimental research.

c. Teaching and training

As a competent healthcare personnel, the student should develop his/her learning skills by applying the fundamental principles of medical education, through teaching and assessing the undergraduate students in medicine and allied health science courses and, by contributing to the training of postgraduate students.

d. Diagnostic laboratory skills

The student should be competent in setting up/supervising/managing a diagnostic laboratory in Biochemistry in a hospital or in any other setup (diagnostic units in remote places or independent of a hospital setting) ensuring quality control along with quality assurance and providing reliable healthcare support services. The student should be able to provide consultation to clinicians and also contribute to community healthcare by conducting screening tests.

e. Professionalism, Ethics, Communication skills

The student should be able to develop and sustain work ethics and empathetic behavior with students and colleagues. He/she should be able to demonstrate professional integrity, honesty, and higher ethical standards and be able to display appropriate attitude and communication skills to interact with colleagues, teachers, students, laboratory personnel, and other healthcare professionals. While dealing with the patients and their relatives, he/she should exhibit compassion, care, and concern.

f. Research

The student should be able to demonstrate his/her competence in carrying out research work and related activities from the planning phase to writing (dissertation/thesis, research report/research paper) by applying the principles of research methodology.

LEARNING OBJECTIVES

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At the end of three years of training in the MD Biochemistry course, a postgraduate student should be able to:

- Demonstrate his/her knowledge of Biochemistry, Cell Biology, Molecular Biology, Molecular diagnostics, Biophysics, and applied aspects of all the mentioned branches to contribute to the teaching-learning processes and healthcare management.
- Identify learning needs and set the learning objectives for his/her self-directed learning and acquire and apply the needful learning in subjects like Genetics, Nutrition & Dietetics, Immunochemistry, and Laboratory Medicine in a relevant context.
- Apply the Medical Education principles to effectively contribute to Teaching-Learning processes, Assessment & Integrated learning.
- Demonstrate his/her knowledge about various aspects of the Competency-based UG medical education implemented w.e.f academic year 2019-20.
- Explain, comprehend and analyze the basics of Cellular and Molecular Biochemistry, functional mechanisms of the biomolecules and their logistics in the human body in normal health and their deviations in the disease conditions. He/she should be able to integrate his/her cognition and skills to facilitate medical education for undergraduate, postgraduate, and allied health sciences students and for patient management.
- Demonstrate administrative, decision-making, group activity, teamwork, and leadership skills in (a) setting up a department in the medical institution and (b) diagnostic services in the hospital and managing them as a part of the healthcare team.
- Analyze, interpret and evaluate laboratory data and provide consultancy to the clinician for judicious use of lab tests, with appropriate interpretation whenever needed, to facilitate the diagnosis, treatment, follow-up, and overall management of patients.
- Conduct research and related activities in the field of Biochemistry, Clinical Biochemistry, Molecular diagnostics, and Medical Education.
- Analyze, interpret, evaluate, appraise and present research-related data and publications to identify the best clinical evidence for research and demonstrate his/her competence in scientific /clinical work presentation.
- Describe the principles of evidence-based medicine, evidence-based practice, good laboratory practice, and good clinical practice.

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- Communicate effectively to fellow colleagues, teachers, patients & their relatives and other healthcare members for providing services to the community.
- Actively participate in all the teaching-learning-related activities like CMEs/workshops/conferences/hands-on-training/Interdepartmental meets/clinical meetings and acquire interpersonal skills.

SUBJECT/DOMAIN-SPECIFIC COMPETENCIES

At the end of three years training course, the postgraduate student should be able to demonstrate the competencies under the following three domains:

A. Cognitive domain (Knowledge domain)

1. Describe the biochemical principles and mechanisms to define and explain a healthy, and a diseased state, and execute the application of the biochemical mechanisms in the perception, diagnosis, and treatment of a disease.
2. Describe the biomolecules and their importance in sustaining life processes.
3. Explain the concept of intermediary metabolism, energy transactions, and metabolic and molecular homeostasis in the sustenance of life.
4. Explain the characteristics, components, and functional significance of different metabolic pathways, their specific intermediates, their inter-conversions, pathway-specific, organ-specific, and interrelated regulation of metabolic pathways, and apply that in explaining the biochemical logic in the functioning of the body in health and disease.
5. Describe and apply the concept of nutrition in health and disease, and critically evaluate the role of essential micro- and macro-nutrients, and their interlinks with cellular metabolism.
6. Apply the integrated knowledge and understanding of biochemical principles and mechanisms in clinical problem-solving.
7. Demonstrate knowledge of genetic engineering in various fields of medicine.
8. Apply the principles of biostatistics in research, clinical laboratory practices, community-based health data collection, and epidemiological surveys.
9. Demonstrate knowledge of the establishment of a diagnostic laboratory and its accreditation process.

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10. Analyze, interpret and evaluate biochemical laboratory findings in integration with the relevant clinical data to evaluate, analyze and monitor a disease state.
11. Apply the knowledge acquired in the basic principles of research methodology to develop a research protocol.
12. Make use of the latest available statistical tools for analyzing the research data, and interpreting and disseminating the results.
13. Demonstrate familiarity with the advances in artificial intelligence and computer-based modeling as and when required.
14. Describe and implement various components of the Competency-based UG Medical Education.
15. Apply the principles of teaching-learning technology while taking interactive classroom lectures, prepare modules for case-based learning (CBL) and problem-based learning (PBL), organize and conduct CBLs/PBLs, case discussions, small group discussions, seminars, journal clubs, and research presentations.
16. Explain the principles of instrumentation and their automation in the Biochemistry laboratory and demonstrate knowledge about the latest advances in technology.
17. Exhibit knowledge of professional ethics and integrity in his/her day-to-day conduct and services rendered.
18. Apply the updated knowledge to suggest and implement judicious use of clinical laboratory investigations.
19. Demonstrate knowledge on the use of laboratory gadgets and instruments taking necessary precautions.
20. Demonstrate knowledge on the preparation of solutions and reagents with necessary precautions as may be required for the estimations in experimental and diagnostic laboratories.
21. Display knowledge about recent advances and trends in the core subject area, research, and laboratory practice along with point-of-care testing (POCT) in the field of biochemistry.

B. Affective domain (Attitudes including Communication and Professionalism)

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1. Communicate appropriately with peers, teachers, healthcare professionals, and patients coming from a variety of backgrounds to explain the molecular and metabolic basis of health and disease in integration with lifestyle management.
2. Demonstrate care, concern, respect, empathy, and compassion while dealing with patients and their relatives at any point of interaction.
3. Demonstrate progressive improvement in AETCOM in routine endeavors through self-assessment, feedback from the peers, stakeholders and adapting to relevant learning.
4. Explain effectively to the patients/their relatives the precautions and preparations needed for them to comply with for specific biochemical analysis/laboratory tests that they will be subjected to.
5. Ensure that the related technical staff is apprised of the above and is duly trained while dealing with the patients.
6. Apply ethical principles and display proper etiquette in dealing with patients, relatives, and other health personnel.
7. Demonstrate appropriate attitude and ethical behavior in exchanging feedback with peers, teachers, clinicians, patients, and their relatives.
8. Display ethical behavior, and personal and professional integrity in his/her conduct and services.
9. Demonstrate the ability to maintain confidentiality in declaring the laboratory results to the concerned personnel wherever applicable.
10. Display awareness and respect for the rights of the patients.
11. Demonstrate counseling skills, especially in the context of nutritional and genetic counseling.
12. Demonstrate competency in judicious decision-making free from personal beliefs/thoughts, pride, and prejudice and, that, no such limitations impact his/her professional performance.

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C. Psychomotor domain

1. Demonstrate the principles and facts of cellular and molecular biochemistry by performing relevant laboratory exercises and analytical tests on body fluids, and other

biologically important substances, along with documentation of the test procedures, results, and interpretation of findings.

2. Develop a differential diagnosis, wherever applicable, based on the results obtained after performing the requisite tests.
3. Plan & conduct lectures, practical demonstrations, tutorial classes, and case-based or problem-based small group discussions for undergraduate students of medical and allied disciplines.
4. Identify, select and perform various biochemical tests in the clinical laboratory which are useful in the diagnosis, treatment, follow-up, and overall management of diseases and be able to interpret the results of such tests.
5. Perform relevant biochemical, immunological, and molecular biology techniques, wherever applicable.
6. Demonstrate compliance with the standard operating procedures of various methods and techniques used in a clinical biochemistry laboratory.
7. Perform enzymatic assays and conduct experiments to study enzyme kinetics affirming the ability to discuss, interpret and document the related data.
8. Perform routine investigations in hematology and microbiology, as and when required.
9. Demonstrate presentation skills at academic meetings and scientific paper writing skills.
10. Prepare research protocols and conduct relevant experimental studies.
11. Analyze and solve clinical and experimental problems.

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By the end of the course, the postgraduate student should be able to demonstrate his competency in performing the following procedures independently:

- Demonstrate the use of all the routine glassware/equipment used in UG teaching-learning in Biochemistry (as per MSR) and advanced instruments used in the clinical laboratory attached to the respective hospital for patient care.
- Preparation of buffers, normal laboratory solutions like molar/molal/normal and reagents with validation.
- Perform all the undergraduate practicals as per the new competency-based medical education prescribed by NMC.

- Perform experiments to study selected reactions of carbohydrates, amino acids and proteins, and lipids.
- Perform experiments to demonstrate constituents of milk.
- Perform experiments to demonstrate normal and abnormal constituents of urine.
- Perform Paper chromatography for separation of amino acids.
- Determination of enzyme activity and study of enzyme kinetics, using any two suitable enzymes (e.g., alkaline phosphatase from any liver tissue or acid phosphatase from potatoes).
- Plot standard curve for different estimations.
- Estimate (including calibration) and interpret clinical analytes as detailed below:
    - Blood glucose, glycated hemoglobin, the performance of glucose tolerance test and glucose challenge test,
    - Total protein, albumin, and A:G ratio,
    - Electrolytes, arterial blood gas analysis,
    - Cholesterol, triglycerides, free fatty acids, low-density lipoprotein cholesterol (LDL-C), high-density lipoprotein cholesterol (HDL-C), phospholipids, Lp(a), and calculated parameters under lipid profile,
    - Amylase, lipase,
    - Urea, creatinine, uric acid, urinary microalbumin,
    - Parameters of liver function tests (bilirubin, hepato-biliary enzymes such as AST, ALT, ALP, GGT, serum proteins/albumin and prothrombin time, CRP),
    - Calcium, magnesium, phosphorus, copper (and ceruloplasmin), serum iron, TIBC, and ferritin,
    - Markers of myocardial damage (CK, CK-MB, troponins, LDH),
    - Vitamin D, $B_{12,}$ and folate,
    - Point-of-care testing (POCT).
- Electrophoresis of serum proteins**,** lipoproteins,
- Separation and molecular weight determination of proteins by SDS-PAGE,
- Electrophoretic separation of LDH isozymes or any other isoenzymes,
- Hb electrophoresis,

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- Renal clearance tests,
- CSF and other body fluid analysis,
- Stone analysis,
- Thyroid function tests, Tumor markers, and relevant hormone assays by ELISA/RIA/Chemiluminescence.

Clinical Laboratory

- Demonstrate familiarity with the essentials of a clinical laboratory setup, the working of autoanalyzer, data transfer, statistical considerations, authorizing and reporting results in an advanced clinical laboratory with an ability to enlist the possible sources of errors (pre-analytical, analytical and post-analytical), perform root cause analysis, and undertake corrective actions, and preventive actions (CAPA).
- Perform and demonstrate activities under total quality management (TQM) of the Laboratory:
  a. Specimen collection, handling, processing, and storage of the sample.
  b. Methods of standardization & calibration.
  c. Methods of quality control, quality assurance, CAPA & assessment.
- Demonstrate ability to prepare and interpret a Levy-Jennings chart and plot inter-assay and intra-assay variation for any analyte estimated in the laboratory.
- Implementation and interpretation of Westgard rules followed by their CAPA, as required.
- Determination of reference values for any one parameter for the clinical laboratory.
- Perform inter-instrumental comparison for at least four parameters.
- Perform in-house calibration of pipettes, centrifuge, hot-air oven, thermometer, and thermo-hygrometer.
- Student should undergo internal auditor training as per ISO 15189:2012, NABL (optional).
- Able to prepare a lab quality manual and frame relevant Standard Operating Procedure (SOP) and Work Desk Instructions (WDI), for every procedure followed in a clinical lab.

Molecular laboratory techniques

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The student should be able to perform the following:

- Isolation of genomic DNA from blood,
- Isolation of RNA, synthesis of cDNA by reverse transcription,
- PCR and Reverse transcriptase PCR (both conventional and real-time),
- Primer designing,
- Blotting techniques,
- Basic techniques and principles of protein/enzyme purification and determining homogeneity.

By the end of the course, the postgraduate student should be able to perform under supervision or, demonstrate familiarity with, as the case may be, the following procedures (at least any five):

1. Separation of peripheral blood leukocytes using relevant isolation technique,
2. Subcellular fractionation/marker enzymes for organelles to demonstrate fractionation and purity of the fraction,
3. Ultracentrifugation,
4. Isolation of plasmids,
5. Basic techniques and essentials in cell culture and establishing different cell culture facilities,
6. High-performance liquid chromatography (HPLC)/GC-MS/LC-MS,
7. Restriction fragment length polymorphism (RFLP),
8. Fluorescent in-situ hybridization (FISH),
9. DNA fingerprinting,
10. Immunodiffusion techniques,
11. Immuno-electrophoresis,
12. Therapeutic drug monitoring,
13. Flow cytometry,
14. Nephelometry,
15. HLA typing.

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SYLLABUS

The course contents are outlined below:

A. Cognitive Domain

Paper I

Biomolecules, Principles of Biophysics and its biomedical importance, Cell biology, Fluid, electrolyte and acid-base balance, Analytical techniques and instrumentation, Biostatistics and research methodology, Basics of medical education in teaching and assessment of Biochemistry.

BIOMOLECULES

Ionization of water, the concept of acid and base, weak acids and bases, pH, pK, Henderson-Hasselbalch equation, buffer and buffering capacity.

Proteins:

- Classification, structure, properties and functions of amino acids and peptides, biologically important peptides,
- Classification, biological significance and structural organization of proteins,
- Structure-function relationship of proteins (haemoglobin, myoglobin, collagen and immunoglobulins),
- Fractionation, purification, structural analysis and characterization of proteins,
- Protein folding and its associated disorders,
- Protein denaturation,
- Protein degradation – lysosomal and proteosomal,
- Plasma proteins.

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Carbohydrates:

- Classification, biomedical importance, functions, properties and reactions of carbohydrates,
- Structural aspects of monosaccharides, disaccharides and polysaccharides,
- Mucopolysaccharides/glycosaminoglycans, glycoproteins and glycolipids,
- Glycation, glycosylation and role of carbohydrates in blood group substances.

Lipids:

- Types, properties and biomedical importance of lipids,
- Fatty acids - nomenclature, classification, properties, reactions including essential fatty acids, polyunsaturated fatty acids and trans fatty acids,
- Mono, di- and triacylglycerols,
- Trans fats,
- Cholesterol - structure, properties and biomedical importance,

- Phospholipids – classification, properties, composition, and biomedical importance of various phospholipids,
- Glycolipids – classification, properties, composition, and biomedical importance,
- Lipoproteins – classification, properties, composition, and functions of various lipoproteins including the role of apoproteins, their importance in health and disease,
- Role of lipids in the structure and function of biological membranes,
- Structure, properties, and biomedical applications of micelles and liposomes.

Nucleotides and nucleic acids:

- Purine and pyrimidine bases in DNA and RNA,
- Nucleosides and nucleotides,
- Biologically important nucleotides (including synthetic analogs of purine/pyrimidine bases and nucleosides used as therapeutic agents),
- Structure, functions, properties, and types of DNA and RNA.

PRINCIPLES OF BIOPHYSICS AND ITS BIOMEDICAL IMPORTANCE

- Diffusion, osmosis, dialysis, surface tension, viscosity, colloids, crystalloids, and suspensoids.

CELL BIOLOGY

- Structural organization and functions of a biological cell and different subcellular organelles along with their marker enzymes,
- Molecular organization, functions, and structure-function relationship of a cell membrane,
- Solute transport across biological membranes with related disorders,
- Cell fractionation and separation of organelles,
- Disorders related to cell membrane and subcellular organelles,
- Intracellular traffic and sorting of proteins,
- Intracellular signaling pathways, membrane receptors and second messenger,
- Intercellular junctions, cellular adhesion molecules, intercellular signaling and communication,
- Extracellular matrix: composition, and biomedical importance,
- Components of the cytoskeleton, and their role in muscle contraction and cell motility,
- Cell cycle, its regulation, and mechanism of cell death,
- Structure and functions of specialized cells.

FLUID, ELECTROLYTE, AND ACID-BASE BALANCE

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- Fluid, electrolyte, and acid-base balance, mechanism of regulation and associated disorders.

ANALYTICAL TECHNIQUES AND INSTRUMENTATION

- Colorimetry,
- Spectrophotometry,
- Atomic absorption spectrophotometry,
- Flame photometry,
- Fluorometry,
- Turbidimetry and nephelometry,
- Gravimetry,
- Electrochemistry (pH electrodes, ion-selective electrodes, gas-sensing electrodes, enzyme electrodes),
- Chemical sensors (biosensors),
- Osmometry,
- Chemiluminescence,
- Water quality testing (TDS, pH, fluoride) for autoanalyzer,
- Electrophoresis (principle, types, applications; isoelectric focusing, capillary electrophoresis; 2-D electrophoresis),
- Chromatography [principle, types (including high-performance liquid chromatography and gas chromatography)],
- Mass spectrometry,
- Immunochemical techniques,
- Techniques in molecular biology,
- Nanotechnology and microfabrication,
- Techniques to study *in vivo* metabolism (NMR, SPECT, PET scan, etc.),
- Radioisotope-based-techniques and their applications (permissions, precautions, management of radioactive waste),
- Automation,
- Point-of-care testing.

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BIOSTATISTICS AND RESEARCH METHODOLOGY

- Basic concepts of biostatistics as applied to health science,
- Statistical tests: t-test, analysis of variance, chi-square test, non-parametric tests, correlation and regression,
- Statistical methods of validation of diagnostic tests,
- Types of study designs and sampling methodologies,
- Meta-analysis and systematic reviews,
- Planning and management of research,
- Electronic search of the literature,
- Ethical aspects related to research and publication,
- Brief introduction of software for data analysis,
- Essentials of intellectual property rights, patents and copyrights.

BASICS OF MEDICAL EDUCATION IN TEACHING-LEARNING AND ASSESSMENT OF BIOCHEMISTRY

- Group dynamics,
- Principles of adult learning, the taxonomy of learning,
- Curriculum planning,
- Educational objectives,
- Developing a lesson plan (appropriate to the objective and teaching learning method),
- Interactive and innovative teaching methods for large and small groups,
- Use of appropriate media (for a learning session),
- Principles of self-directed learning and giving feedback,
- Framing appropriate essay questions, short answer questions and multiple-choice questions,
- Item analysis and preparation of question bank,
- Principles and types of assessment,
- Methods of assessing cognitive skills, psychomotor skills, communication skills, and professionalism (including viva voice and OSPE),
- Developing a plan for internal assessment and formative assessment,

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- Preparation of blueprint and setting of question paper,
- Microteaching,
- Reflection writing.

Paper II

Enzymes, Bioenergetics, Biological oxidation, Intermediary metabolism and inborn errors of metabolism, Nutrition, Vitamins and Minerals, Detoxification and metabolism of xenobiotics, Free radicals and anti-oxidant defense systems

ENZYMES

- Properties, classification, mechanism of action, coenzymes and cofactors, proenzymes, ribozymes, nanozymes, catalytic antibodies,
- Factors affecting the rate of enzyme-catalyzed reaction,
- Kinetics of enzyme activity, regulation of enzyme activity,
- Isoenzymes and isoforms, role in metabolic regulation,
- Enzyme inhibition,
- Principles of enzyme assays,
- Applications of enzymes: diagnostic, therapeutic and commercial uses of enzymes,
- Enzymes as targets for drug development.

BIOENERGETICS

- Basic concepts of thermodynamics and its laws, as applicable to living systems,
- Exergonic and endergonic reactions and coupled reactions, redox potential,
- High energy compounds,
- Enzymes of biological oxidation,
- Cytochromes.

BIOLOGICAL OXIDATION

- Components, complexes and functioning of the respiratory chain including inhibitors,
- Process and regulation of oxidative phosphorylation including uncouplers,
- Mechanisms of ATP synthesis and regulation,
- Mitochondrial transport systems and shuttles,
- Mitochondrial diseases.

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INTERMEDIARY METABOLISM AND INBORN ERROR OF METABOLISM

Metabolism of carbohydrates:

- Digestion and absorption including associated disorders,
- Glycolysis and TCA (Kreb's cycle), including regulation,
- Glycogen metabolism and its regulation,
- Cori cycle, gluconeogenesis,
- Metabolism of fructose and galactose and their clinical significance,
- Pentose phosphate /HMP shunt pathway and uronic acid pathways and their clinical significance,
- Polyol/sorbitol pathway,
- Regulation of blood glucose, hyperglycemia, hypoglycemia and their clinical significance,
- Glucose tolerance test and its interpretation,
- Diabetes mellitus – classification, pathogenesis, metabolic derangements and complications, diagnostic criteria and laboratory investigations, principles of treatment (including diet and lifestyle modification),
- Inborn errors and disorders of carbohydrate metabolism.

Metabolism of Lipids:

- Digestion and absorption and associated disorders,
- Metabolism of fatty acids, regulation and related disorders,
- Metabolism of eicosanoids and their clinical significance,
- Metabolism of triacylglycerol, storage and mobilization of fats,
- Metabolism of adipose tissue and its regulation,
- Metabolism of cholesterol including its transport and hypercholesterolemia,
- Metabolism of lipoproteins, atherosclerosis, fatty liver and lipid profile,
- Metabolism of methanol and ethanol,
- Role of liver in lipid metabolism,
- Metabolism of phospholipids and associated disorders,
- Metabolism of glycolipids and associated disorders,

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- Inborn errors of lipid metabolism.

Metabolism of amino acids and proteins:

- Digestion, absorption and associated disorders,
- Deamination, transamination, disposal of the amino group, catabolism of the carbon skeleton of amino acids,
- Formation and disposal of ammonia (including urea cycle) and related disorders, ammonia toxicity,
- Metabolism of individual amino acids and associated disorders,
- One carbon metabolism,
- Biogenic amines,
- Inborn errors of amino acid metabolism.

Metabolism of nucleotides:

- Metabolism of purines and pyrimidines and their associated disorders.

Metabolism of haem:

- Metabolism of haem and associated disorders.

Interorgan and intraorgan interrelationships and integration of metabolic pathways:

- Metabolic adaptation in starvation, diabetes mellitus, obesity, and during exercise.

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NUTRITION

- Calorific value, Basal Metabolic Rate (BMR), Specific dynamic action (SDA) of food.
- Nutritional importance of proximate principles of food including sources and RDA.
- Glycemic index.
- Biological value of proteins and nitrogen balance.
- Thermogenic effect of food.
- General nutritional requirements.
- Balanced diet, diet formulations in health and disease, mixed diet.
- Calculation of energy requirements and prescribing diet.
- Nutritional supplements and parenteral nutrition.
- Food toxins and additives.

- Disorders of nutrition, obesity, protein energy malnutrition, under-nutrition and laboratory diagnosis of nutritional disorders.
- National Nutrition Programme.

VITAMINS AND MINERALS

- Structure, functions, sources, RDA, and metabolism of vitamins and minerals and their associated disorders.

DETOXIFICATION AND METABOLISM OF XENOBIOTICS

FREE RADICALS AND ANTI-OXIDANT DEFENSE SYSTEMS

- Free radicals and anti-oxidant defense systems in the body.
- Associations of free radicals with disease processes.
- Oxygen toxicity.
- Oxidative stress markers in blood, urine, and other biological fluids.

Paper III:

Molecular biology, Molecular and genetic aspects of cancer, Immunology, and Environmental Biochemistry

MOLECULAR BIOLOGY

Structure and organization of chromosomes and chromatin re-modeling

DNA replication:

- DNA replication in prokaryotes and eukaryotes (including important differences between the two).
- End replication problem: Telomere, telomerase and their role in health and disease.
- DNA repair mechanisms and their associated disorders.
- Inhibitors of DNA replication and their clinical significance.
- DNA recombination.
- DNA protein interaction.

Transcription:

- Structure of a gene - exons and introns, promoter, enhancers/repressors and response

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elements.

- Process of transcription in prokaryotes and eukaryotes.
- Post-transcriptional modifications.
- Inhibitors of transcription.
- RNA editing and stability.

Genetic code, gene polymorphism, and mutation:

- Characteristics of the genetic code.
- Molecular basis of the degeneracy of the genetic code (Wobble hypothesis).
- Mutation and gene polymorphism.
- Mutagens- examples of physical, chemical, and biological mutagens.
- Types of mutations.
- Mutation in health and disease.

Translation:

- Basic structure of prokaryotic and eukaryotic ribosomes.
- Process of protein synthesis (translation) in prokaryotes and eukaryotes.
- Post-translational modifications.
- Protein sorting, protein targeting, protein folding and related disorders.
- Inhibitors of translation in prokaryotes and eukaryotes, and their clinical significance.

Regulation of gene expression in prokaryotes and eukaryotes

Recombinant DNA technology and its applications in modern medicine

Overview of human genome project

Basics of bioinformatics

Principles of human genetics:

- Alleles, genotypes and phenotypes.
- Patterns of inheritance: monogenic and polygenic inheritance.
- Population genetics.
- Genetic factors in causation of diseases.
- Types of genetic diseases: Chromosomal, monogenic and polygenic disorders,

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mitochondrial disorders, nucleotide repeat expansion disorders, imprinting disorders.

- Screening for genetic diseases and prenatal testing.
- Ethical and legal issues related to medical genetics.

Stem cells and regenerative medicine:

- Basic concepts regarding stem cells
- Types of stem cells: embryonic and induced pluripotent stem cells (IPSC)
- Application in regenerative medicine and disease therapeutics
- Ethical and legal issues related to use of stem cells in medicine.

MOLECULAR AND GENETIC ASPECTS OF CANCER

- Biochemical characteristics of a cancer cell
- Biochemistry of carcinogenesis
- Carcinogens
- Role of oncogenes and tumor suppressor genes
- Genetic alterations and adaptations in cancer
- Tumor markers, cancer risk assessment, and community screening
- Biochemical basis of cancer chemotherapy and drug resistance
- Anti-cancer therapy.

IMMUNOLOGY

- Organization and components of the immune system
- Innate and adaptive immunity- components and functions
- Antigens, immunogens, epitopes and haptens, carriers, adjuvants
- Immunoglobulin: structure, types, and functions
- Mechanism of antibody diversity: organization and expression of immunoglobulin genes, immunoglobulin gene rearrangement, class switching
- Humoral and cell-mediated immunity, regulation of immune responses, immune response to infections
- Major histocompatibility complex, antigen processing, and presentation
- Antigen-antibody interaction, immune effector mechanisms
- Complement system

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- Hypersensitivity reactions
- Tolerance, autoimmunity
- Immunodeficiency, immune unresponsiveness, and their clinical implications
- Vaccines
- Immunology of chronic diseases
- Transplantation immunology
- Immunodiagnostics and immunotherapy.

ENVIRONMENTAL BIOCHEMISTRY

Health and pollution

Effects of environmental pollutants on the body

Paper IV

Basic principles and practice of clinical biochemistry, Biochemical analytes, Assessment of organ system functions, and Recent advances in biochemistry

BASIC PRINCIPLES AND PRACTICE OF CLINICAL BIOCHEMISTRY

- Units of measurement, reagents, clinical laboratory supplies, basic separation techniques, laboratory calculations, specimen collection, transport and processing, safety in the laboratory,
- Essentials of clinical investigations in Biochemistry, the clinical utility of laboratory tests (including accuracy, precision, sensitivity, specificity, ROC curves, etc), analysis in the laboratory, and selection and evaluation of methods (including statistical techniques),
- Evidence-based laboratory medicine, establishment and use of reference values, pre-analytical, analytical, and post-analytical variables and biological variations, total quality management (TQM), clinical laboratory and hospital informatics, concepts and reporting of critical values.

BIOCHEMICAL ANALYTES

Biochemical analyses and their clinical significance:

- Amino acids, peptides and proteins; non-protein nitrogenous compounds
- Enzymes

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- Carbohydrates
- Lipids, lipoproteins and apolipoproteins and other cardiovascular risk markers
- Electrolytes
- Blood gases and pH
- Hormones
- Catecholamines, serotonin, and other neurotransmitters
- Vitamins, minerals, trace and toxic elements
- Hemoglobin, and bilirubin
- Porphyrins
- Bone markers
- Tumour markers.

Body fluid analysis

Stone analysis

Therapeutic drug monitoring

Clinical toxicology

Pharmacogenomics

Pediatric and geriatric biochemical investigations

- Biochemistry of aging

ASSESSMENT OF ORGAN SYSTEM FUNCTIONS

Hematopoietic disorders:

- Hemostasis and thrombosis-biochemical mechanism, related laboratory tests, antiplatelet therapy anticoagulant therapy, and fibrinolytic therapy
- Anemia- classification, etiology, laboratory investigations, and management
- Hemoglobinopathies - sickle cell anemia, methemoglobinemia, thalassemia syndromes
- RBC membrane, metabolism, inherited defects in RBC membrane, and enzymes
- ABO blood group system – the biochemical basis of incompatibility and transfusion

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biology

- Plasma cell disorders
- Other disorders of hematopoietic cells and their progenitors.

Endocrine system:

- Classification and general mechanism of action of hormones
- Biosynthesis, secretion, regulation, transport, and mode of action of hypothalamic peptides, adenohypophyseal and neurohypophyseal hormones, thyroid and parathyroid hormones, calcitonin, pancreatic hormones, adrenocortical and medullary hormones, gonadal hormones, gastrointestinal hormones, opioid peptides, parahormones
- Neuro-modulators and their mechanism of action and physiological significance
- Biochemical aspects of diagnosis and treatment of endocrinal disorders
- Endocrinology of conception, reproduction, and contraception
- Antenatal testing, newborn screening, and inborn errors of metabolism.

Cardiovascular system:

- Atherosclerosis - pathogenesis, risk factors, prevention and treatment
- Biochemistry of cardiac failure, acute coronary syndrome, cardiomyopathies, and cardiac arrhythmias
- Cardiac biomarkers.

Respiratory system:

- Pulmonary gaseous exchanges in health and disease
- Biochemistry of respiratory disorders.

Renal system:

- Biochemistry of kidney functions
- Pathophysiology, biochemistry, laboratory findings and management in acute and chronic kidney diseases
- Nephrolithiasis, biochemical aspects of renal stones
- Biochemistry of renal transplant.

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Gastrointestinal system:

- Biochemistry of gastric functions
- Regulatory peptides in the gut
- Digestion and absorption of nutrients, evaluation of malabsorption
- Biochemical aspects of- Peptic ulcer diseases, Zollinger-Ellison syndrome, Celiac disease, Inflammatory bowel disease, Protein losing enteropathy and Neuroendocrine tumors.

Hepato-biliary and pancreatic system:

- Biochemistry of hepato-biliary and pancreatic functions
- Formation, composition and functions of bile
- Pathophysiology, biochemistry, laboratory findings and management in acute and chronic hepato- biliary and pancreatic disorders.

Skeletal system:

- Bone structure**,** metabolism, associated disorders and markers
- Bone mineral homeostasis.

Nervous system:

- Neurotransmitters and their receptors
- Ion channels and channelopathies
- Neurotrophic factors
- Infective and inflammatory diseases of nervous system (meningitis, encephalitis etc.)
- Protein aggregation, neurodegeneration and related disorders (Alzheimer's disease, Parkinson's disease, Huntington's disease, and others)
- Prions and prion diseases
- Ischemic and hemorrhagic neuro disorders
- Neuro-immune disorders (Guillain-Barre syndrome, Myasthenia gravis, multiple sclerosis and others)
- Pathophysiology and biochemistry of psychiatric disorders
- ***Recent advances in Biochemistry.***

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B. Psychomotor Domain

The course contents are mentioned under Subject/domain-specific competencies.

TEACHING AND LEARNING METHODS

General principles

Acquisition of competencies being the keystone of doctoral medical education, such training should be skill oriented. Learning in the program, essentially autonomous and self-directed, and emanating from academic and clinical work, shall also include assisted learning. The formal sessions are meant to supplement this core effort.

All students joining the postgraduate (PG) courses shall work as full-time (junior) residents during the period of training, attending not less than 80% of the training activity during the calendar year, and participating in all assignments and facets of the educational process. They shall maintain a logbook for recording the training they have undergone, and details of the procedures done during laboratory and clinical postings in real-time.

Teaching-Learning methods

This should include a judicious mix of demonstrations, symposia, journal clubs, clinical meetings, seminars, small group discussion, bed-side teaching, case-based learning, simulation-based teaching, self-directed learning, integrated learning, interdepartmental meetings and any other collaborative activity with the allied departments. Methods with exposure to the applied aspects of the subject relevant to basic/clinical sciences should also be used. **The suggested examples of teaching-learning methods are given below but are not limited to these. The frequency of various below-mentioned teaching-learning methods can vary based on the subject's requirements, competencies, workload, and overall working schedule in the concerned subject.**

A. Lectures: Didactic lectures should be used sparingly. A minimum of 10 lectures per year in the concerned PG department is suggested. Topics to be selected as per subject requirements.

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All postgraduate trainees will be required to attend these lectures. Lectures can cover topics such as:

1. Subject related important topics as per specialty requirement
2. Recent advances
3. Research methodology and biostatistics
4. Salient features of Undergraduate/Postgraduate medical curriculum
5. Teaching and assessment methodology.

Topic numbers 3,4,5 can be done during research methodology/biostatistics and medical education workshops in the institute.

B. Journal club: Minimum of once in 1-2 weeks is suggested.

Topics will include presentation and critical appraisal of original research papers published in peer reviewed indexed journals. The presenter(s) shall be assessed by faculty and grades recorded in the logbook.

C. Student Seminar: Minimum of once every 1-2 weeks is suggested.

Important topics should be selected as per subject requirements and allotted for in-depth study by a postgraduate student. A teacher should be allocated for each seminar as faculty moderator to help the student prepare the topic well. It should aim at comprehensive evidence-based review of the topic. The student should be graded by the faculty and peers.

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D. Student Symposium: Minimum of once every 3 months.

A broad topic of significance should be selected, and each part shall be dealt by one postgraduate student. A teacher moderator should be allocated for each symposium and moderator should track the growth of students. The symposium should aim at an evidence-based exhaustive review of the topic. All participating postgraduates should be graded by the faculty and peers.

E. Laboratory work / Bedside clinics: Minimum-once every 1-2 weeks.

Laboratory work/Clinics/bedside teaching should be coordinated and guided by faculty from the department. Various methods like DOAP (Demonstrate, Observe, Assist, Perform),

simulations in skill lab, and case-based discussions etc. are to be used. Faculty from the department should participate in moderating the teaching-learning sessions during laboratory work.

F. Interdepartmental colloquium

Faculty and students must attend monthly meetings between the main department and other department/s on topics of current/common interest or clinical cases.

G. a. Rotational clinical / community / institutional postings

Depending on local institutional policy and the subject specialty needs, postgraduate trainees may be posted in relevant departments/ units/ institutions. The aim would be to acquire more in-depth knowledge as applicable to the concerned specialty. Postings would be rotated between various units/departments and details to be included in the specialty-based Guidelines.

Suggested departments and duration of rotational postings:

- General Medicine - 1 month (includes Endocrinology, Pediatrics, and ICU posting)
    - ✓ Endocrinology [Focus: Clinical correlation and important investigations related to diabetes mellitus and other diseases, dietary advice, point-of-care testing]
    - ✓ ICU/ICCU [Focus: ABG analysis and correlation, electrolyte imbalances, cardiac biomarkers and correlation, markers of septicemia and its management, basics of ventilation]
    - ✓ Pediatrics [Focus: Inborn errors of metabolism and other common diseases, nutritional disorders, and dietary advice]
- Hematology - 15 days
- Immunohematology and blood transfusion (Transfusion Medicine)/Blood bank - 15 days
- Microbiology- 15 days
- Medical Education Unit (MEU) or Department of Medical Education (DOME) - one week/ shall attend a specific workshop or a training course [Focus:

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Principles of teaching-learning-assessment and other important aspects of Medical Education].

G.b. Posting under "District Residency Programme" (DRP):

All postgraduate students pursuing MD/MS in broad specialties in all Medical Colleges/Institutions shall undergo a compulsory rotation of three months in the District Hospital/District Health System as a part of the course curriculum, as per the Postgraduate Medical Education (Amendment) Regulations (2020). Such rotation shall take place in the 3rd or 4th or 5th semester of the Postgraduate program and the rotation shall be termed as "District Residency Programme" and the PG medical student undergoing training shall be termed as "District Resident".

Every posting should have its defined learning objectives. It is recommended that the departments draw up objectives and guidelines for every posting offered in conjunction with the collaborating department/s or unit/s. This will ensure that students acquire expected competencies and are not considered as an additional helping hand for the department / unit in which they are posted.The PG student must be tagged along with those of other relevant departments for bedside case discussion/basic science exercises as needed, under the guidance of an assigned faculty.

Opportunities to present and discuss infectious disease cases through bedside discussion and ward/grand rounds with specialists/clinicians in different hospital settings must be scheduled to address antimicrobial resistance issues and strategies to deal with it.

H. Teaching research skills

Writing a thesis should be used for inculcating research knowledge and skills. All postgraduate students shall conduct a research project of sufficient depth to be presented to the University as a postgraduate thesis under the supervision of an eligible faculty member of the department as a guide and one or more co-guides who may be from the same or other departments.

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In addition to the thesis project, every postgraduate trainee shall participate in at least one additional research project that may be started or already ongoing in the department. It is preferable that this project will be in an area different from the thesis work. For instance, if a clinical research project is taken up as thesis work, the additional project may deal with community/field/laboratory work. Diversity of knowledge and skills can thereby be reinforced.

I. Training in teaching skills

MEU/DOME should train PG students in education methodologies and assessment techniques. The PG students shall conduct UG classes in various courses and a faculty shall observe and provide feedback on the teaching skills of the student.

J. Log book

During the training period, the postgraduate student should maintain a logbook indicating the duration of the postings/work done in wards, OPDs, casualty, and other areas of the posting. This should indicate the procedures assisted and performed and the teaching sessions attended. The logbook entries must be done in real-time. The logbook is thus a record of various activities by the student like (1) Overall participation & performance, (2) attendance, (3) participation in sessions, (4) record of completion of pre-determined activities, and (5) acquisition of selected competencies.

The purpose of the logbook is to:

a) help maintain a record of the work done during training,
b) enable faculty/consultants to have direct information about the work done and intervene, if necessary,
c) provide feedback and assess the progress of learning with experience gained periodically.

The logbook should be used in the internal assessment of the student, and should be checked and assessed periodically by the faculty members imparting the training. The PG students will be required to produce a completed log book in original at the time of final practical examination. It should be signed by the Head of the Department. A proficiency certificate

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from the Head of Department regarding the clinical competence and skillful performance of procedures by the student will be submitted by the PG student at the time of the examination.

The PG students shall be trained to reflect and record their reflections in the logbook particularly of the critical incidents. Components of good teaching practices must be assessed in all academic activity conducted by the PG student and atleast two sessions dedicated for assessment of teaching skills must be conducted every year of the PG program. The teaching faculty are referred to the NMC (Erstwhile MCI) Logbook Guidelines uploaded on the website.

K. **Course in Research Methodology**: All postgraduate students shall complete an online course in Research Methodology within six months of the commencement of the batch and generate the online certificate on successful completion of the course.

Other aspects

- The postgraduate trainees must participate in the teaching and training program of undergraduate students and interns attending the department.
- Trainees shall attend accredited scientific meetings (CME, symposia, and conferences) at least once a year.
- Department shall encourage e-learning activities.
- The postgraduate trainees should undergo training in Basic Cardiac Life Support (BCLS) and Advanced Cardiac Life Support (ACLS).
- The postgraduate trainees must undergo training in information technology and use of computers.

During the training program, patient safety is of paramount importance; therefore, relevant clinical skills are to be learned initially on the models, and later to be performed under supervision followed by independent performance. For this purpose, the provision of skills laboratories in medical colleges is mandatory.

ASSESSMENT

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The assessment for postgraduate student in Biochemistry will be of two types; Formative and Summative

FORMATIVE ASSESSMENT

Formative assessment is the assessment conducted during the training with the primary purpose of providing feedback for improving learning. It should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self-directed learning, and ability to practice in the system. The formative assessment will be used to determine the existing knowledge base and future needs, and identify priority areas.

General Principles

The Internal Assessment will include both theory and practical examination. It should be frequent, cover all domains of learning, and should be used to provide feedback to improve learning; it should also cover professionalism and communication skills.

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Formative assessment during the MD training should be based on:

- Case presentation/case work up : once a week
    - The student will present a case from ward/lab along with investigations done in the clinical laboratory
- Laboratory performance : once a week
    - The student will analyze an unknown sample on an autoanalyzer, starting with calibration, quality control of the machine, and then loading the sample. He/she will do the reporting and interpret the results and will be evaluated the next day.
    - He/she will be evaluated separately for practicals listed in the undergraduate syllabus.
    - He/she will be evaluated at the end of each postgraduate practical session as listed under the psychomotor domain.

- Journal club : once a quarter

- The student will present and critically evaluate an original research article. The article should be preferably from outside his/her area of work so that he/she can learn newer techniques. The focus should be on understanding the research question and evaluating whether appropriate study design, methodology, and statistical tools were used to find answers to the same.

- Seminar : once a fortnight
    - The student will present a topic from the syllabus and will try to research and include recent advances on that topic. He/she will also present recent advances (not included in the syllabus) periodically.
- Micro-teaching : Once a week
    - The teaching skills of the student will be evaluated. Special topics can be given, and the student will teach that topic to the evaluators or he/she may be evaluated during pre-practical briefing of undergraduate students.
- Interdepartmental case or seminar : once in 3 months
    - This should be organized at the institute level and appropriate vertical and horizontal integration should be ensured.

  Note: These sessions may be organized and recorded as an institutional activity for all postgraduates.
- AETCOM : Once in every six months
    - The postgraduate student can be evaluated during the AETCOM sessions of the undergraduates.
    - Case scenarios should be provided and the postgraduate will be asked to demonstrate how he/she will respond to the situation.

- Attendance at Scientific meetings, CME programmes (at least 02 each during the course)

The student is to be assessed periodically as per categories listed in the appropriate (non-clinical/clinical) postgraduate student appraisal form (Annexure I).

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SUMMATIVE ASSESSMENT, ie., assessment at the end of training to evaluate whether the student has acquired sufficient knowledge and skills to be awarded MD degree

Essential pre-requisites for appearing for examination include:

1. **Logbook** of work done during the training period including rotational postings, departmental presentations, and reports of the internal assessment conducted during the training period should be submitted.

2. At least **two presentations** at national-level conferences. One research paper should be under submission for publication/ accepted for publication/ published in an indexed journal**. (It is suggested that the local or University Review committee assess the work sent for publication).**

The summative examination would be carried out as per the rules given in the latest POSTGRADUATE MEDICAL EDUCATION REGULATIONS. The theory examination shall be held in advance before the clinical and practical examination so that the answer books can be assessed and evaluated before the commencement of the clinical/practical and oral examination**.**

The postgraduate examination shall be in three parts**:**

1. **Thesis**

   Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination. The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination. A post graduate student in broad specialty shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners**.**

2. **Theory examination**

   The examinations shall be organized on the basis of 'Grading' or 'Marking system' to evaluate and certify post-graduate student's level of knowledge, skill, and competence at the end of the training, as given in the latest POSTGRADUATE MEDICAL

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EDUCATION REGULATIONS. Obtaining a minimum of 50% marks in 'Theory' as well as 'Practical' separately shall be mandatory for passing the examination as a whole. The examination for M.D./ M.S shall be held at the end of the 3rd academic year.

There shall be four theory papers (as per PG Regulations):

Paper I:
Biomolecules, Principles of Biophysics and its biomedical importance, Cell biology, Fluid, electrolyte and acid-base balance, Analytical techniques, and instrumentation, Biostatistics and research methodology, Basics of medical education in teaching and assessment of Biochemistry.

Paper II:
Enzymes, Bioenergetics, Biological oxidation, Intermediary metabolism and inborn errors of metabolism, Nutrition, Vitamins and Minerals, Detoxification and metabolism of xenobiotics, Free radicals, and anti-oxidant defense systems

Paper III:
Molecular biology, Molecular and genetic aspects of cancer, Immunology, and Environmental Biochemistry

Paper IV:
Basic principles and practice of clinical biochemistry, Biochemical analytes, Assessment of organ system functions, and Recent advances in biochemistry

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3. Practical/clinical and Oral/viva voce examination

Practical examination

The practical examination should be spread over **two** days and include various major components of the syllabus focusing mainly on the psychomotor domain. One day should be for conducting practical examination including table viva that will focus on the nuances of laboratory techniques and quality assurance.

The practical examination should include:

1. One Clinical / Paper case: An unknown sample will be analyzed by the student, and he/she will have to prepare the report along with the interpretation of the same. It should include both serum and urine analysis.
2. One practical exercise on any molecular biology technique.

3. One practical exercise on immunology technique.
4. OSPE: It shall be conducted on various topics which have not been covered in the above-mentioned practical and should include, if possible, evaluation of AETCOM (Attitude, Ethics, and Communication) skills of the students.
5. Evaluation of laboratory management skills.

Oral/Viva voce examination on defined areas should be conducted by each examiner separately. The oral examination shall be comprehensive enough to test the postgraduate student's overall knowledge of the subject focusing on the psychomotor and affective domains.

The **Oral/Viva-voce examination shall be conducted on the second day and should include:**

1. Thesis presentation
   The ability of the student to justify the methodology, and findings with interpretation, should be evaluated.
2. Micro-teaching
   The essentials of classroom teaching skills should be evaluated.
3. Grand viva voce

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Recommended Reading:

Books (latest edition)

1. Lehninger Principles of Biochemistry, David L. Nelson, Michael M. Cox. W H Freeman & Co (Sd).
2. Biochemistry (Stryer), Jeremy M. Berg , John L. Tymoczko , Lubert Stryer, W. H. Freeman.
3. Biochemistry (Voet & Voet), Donald Voet , Judith G. Voet, John Wiley & Sons Inc.
4. Textbook of Biochemistry with Clinical Correlations, Thomas M. Devlin, John Wiley & Sons.
5. Kuby Immunology, Judy Owen, Jenni Punt , Sharon Stranford, W. H. Freeman.
6. Principles and Techniques of Biochemistry and Molecular Biology. Wilson/Walker; Cambridge University Press

7. Clinical Chemistry: Principles, Techniques, and Correlations, Michael L Bishop, Edward P Fody, Larry E Schoeff, Lippincott Williams and Wilkins.
8. Tietz Textbook of Clinical Chemistry and Molecular Diagnostics, Carl A. Burtis, Edward R. Ashwood , Saunders.
9. Harpers Illustrated Biochemistry, Victor W. Rodwell , David Bender, Kathleen M. Botham, Peter J. Kennelly, P. Anthony Weil , McGraw-Hill Education / Medical.
10. Biochemistry (Lippincott's Illustrated Reviews), Denise R Ferrier, Lippincott Williams and Wilkins.
11. Harrison's Principles of Internal Medicine, Dennis L. Kasper, Anthony S. Fauci, Stephen L. Hauser, Dan L. Longo, J. Larry Jameson, Joseph Loscalzo, McGraw-Hill Education / Medical.
12. Davidson's Principles and Practice of Medicine, Walker, Elsevier Health Sciences – UK.
13. Clinical Biochemistry: Metabolic and Clinical Aspects, William J. Marshall & Márta Lapsley & Andrew Day & Ruth Ayling, Imprint - Churchill Livingstone.
14. Biochemistry: A Case-oriented Approach, Rex Montgomery, Thomas W. Conway, Arthur A. Spector, David Chappell, Mosby.
15. Interpretation of Diagnostic tests, Jacques Wallach, Lippincott Williams & Wilkins.

Journals

03-05 international Journals and 02 national (all indexed) journals.

Annexure 1

Student appraisal form for MD in Biochemistry

	Elements	Less than Satisfactory			Satisfactory			More than satisfactory			Comments
		1	2	3	4	5	6	7	8	9	
1	**Scholastic aptitude and learning**										
1.1	Has knowledge appropriate for level of training										
1.2	Participation and contribution to learning activity (e.g., Journal Club, Seminars, CME etc)										
1.3	Conduct of research and other scholarly activity assigned (e.g Posters, publications etc)										
1.4	Documentation of acquisition of competence (eg Log book)										
1.5	Performance in work based assessments										
1.6	Self-directed Learning										
2	**Work related to training**										
2.1	Practical skills that are appropriate for the level of training										
2.2	Respect for processes and procedures in the work space										
2.3	Ability to work with other members of the team										
2.4	Participation and compliance with the quality										

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	improvement process at the work environment										
2.5	Ability to record and document work accurately and appropriate for level of training										
3	**Professional attributes**										
3.1	Responsibility and accountability										
3.2	Contribution to growth of learning of the team										
3.3	Conduct that is ethically appropriate and respectful at all times										
4	**Space for additional comments**										
5	**Disposition**										
	Has this assessment pattern been discussed with the trainee?	Yes	No								
	If not explain.										
	Name and Signature of the assesse										
	Name and Signature of the assessor										
	Date										

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GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR MD IN COMMUNITY MEDICINE

Preamble

The purpose of PG education is to create specialists who would provide high quality health care and advance the cause of science through research & training.

Community Medicine is an academic subject, a branch of Medicine which deals with promotion of health and prevention of diseases, involving people's participation, utilizing professional management skills. The Community Medicine specialist, will inculcate a holistic view of health and medical interventions primarily focused on Community Health/Population Health. Thus, he/she should be equipped with the knowledge, skills, competencies in primary, secondary & tertiary care, control and prevention of outbreaks/epidemics, community diagnosis, health needs assessment, epidemiological assessment, research and planning evidence-based health policies and programmes.

The Guidelines for teaching Community Medicine, therefore, should be designed to create a cadre of professionals who are competent to meaningfully contribute their expertise in planning, implementation, co-ordination, monitoring, evaluation of Primary Health Care Programs based on scientific evidence. The competencies must cover a wide spectrum of skills viz., technical, managerial, administrative, organizational skills, applied skills in Health Information Management, software application and soft skills of communication, motivation, decision-making, team building, training in scientific communication and medical writing.

The purpose of this document is to provide teachers and learners illustrative guidelines to achieve defined outcomes through learning and assessment. This document was prepared by various subject-content specialists. The Reconciliation Board of the Academic Committee has attempted to render uniformity without compromise to purpose and content of the document. Compromise in purity of syntax has been made in order to preserve the purpose and content. This has necessitated retention of "domains of learning" under the heading "competencies".

SUBJECT SPECIFIC OBJECTIVES

1. To create a skilled cadre of medical professionals having expertise in application of principles of Public Health, Community Medicine and applied epidemiology, contributing meaningfully in formulating National Health Policies & Programmes with a systems approach for overall human development.
2. To standardize the teaching & training approaches at post- graduate level, for Community Medicine

3. Research: To formulate research questions, do literature search, conduct study with an appropriate study design and study tool; conduct data collection and management, data analysis and report.

SUBJECT SPECIFIC COMPETENCIES

At the end of the course the student should be able to acquire the following competencies under the three domains, Cognitive, Affective and Psychomotor:

A. Cognitive domain (The student should be able to:)

1. Describe conceptual (and applied) understanding of Public Health, Community Medicine, clinical and disease-oriented approach, preventive approach & health promotion, disease control & promotion.
2. Have knowledge about communicable and non-communicable diseases, emerging and re-emerging diseases, their epidemiology, control and prevention.
3. Apply the principles of epidemiology, health research and Bio-statistics, application of qualitative research methods
4. Calculate Odds Ratio, Relative Risk, Attributable risk and other relevant health and morbidity indicators.
5. To describe nutritional problems of the country, role of nutrition in health and disease and to describe common nutritional disorders
6. Develop nutrition plan for an individual based on his requirements and with concerns to special situations if applicable
7. Plan comprehensive programme to address issue of malnutrition in a given area for a specific group
8. To describe the concept of Environmental Health and its various determinants.
9. Identify environmental health issues in a given area/community
10. Assess impact of adverse environmental conditions on health of human beings
11. Plan awareness programmes at various levels on environmental issues and mobilize community resources and participation to safeguard from local adverse environmental conditions
12. Should be able to provide technical advice for water purification, chlorination, installing gobar gas plant, construction of soakage pits etc.
13. Be a technical expert to advice on protection measures from adverse environmental exposure
14. To describe the working of Primary Health Care system, Panchayat Raj system, National Health Programmes, urban/rural differences, RCH, Demography and Family Welfare.
15. Do orientation of the inter-linkage of health sector and non-health sector for promotion of Health & control and prevention of diseases.
16. Have familiarity with administrative procedures and protocols
17. Have knowledge about role of media and its use in health.

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18. Have knowledge of Health Care Administration, Health Management and Public Health Leadership
19. To describe Health Policy planning, Medical Education technology, Information Technology and integration of alternative Health system including AYUSH.
20. To describe the intricacies of Social & Behavioral sciences and their applications.
21. To describe Public Health Legislations
22. To understand and describe International Health & Global Diseases surveillance.
23. To relate the history of symptoms with specific occupation, diagnostic criteria, preventive measures, identification of various hazards in a specific occupational environment and legislations.
24. To keep abreast of recent advances in Public Health & formulate feasible, optimal, sustainable, cost effective strategies in response to the advances in public health & development.
25. To describe the principles of Health Economics and apply it in various public health settings.
26. To explain and correlate common health problems (medical, social, environmental, economic, psychological) of urban slum dwellers, organization of health services in urban slum areas
27. Develop workable interventions for control and prevention of emerging and re-emerging diseases at local, national and global level.
28. Identify behavior pattern of individual or group of individuals detrimental or adversely affecting their health
29. Define and identify vulnerable, under-privileged high risk communities and their special needs
30. To create awareness about various public health laws
31. Evaluate cost effectiveness and cost benefits of a Health Program
32. Understand and express implications of 'Poverty Line', 'Social Inclusion', 'Equity', 'taxations', 'Insurance' on Health care management.
33. To categorize hospital waste and be able to guide for proper disposal.
34. To provide a comprehensive plan for disaster management and mitigation of sufferings.

B. Affective domain:

1. Should be able to function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the patient and the clinician or other colleagues to provide the best possible diagnosis or opinion.
2. Always adopt ethical principles and maintain proper etiquette in dealings with patients, relatives and other health personnel and to respect the rights of the patient including the right to information and second opinion.
3. Develop communication skills to word reports and professional opinion as well as to interact with patients, relatives, peers and paramedical staff, and for effective teaching.

A. C. Psychomotor domain: ((The student should be able to:)

The student should be able to perform independently the following :

- Conduct community surveys for assessment of health & morbidity profile, epidemiological determinants, assessment of health needs, disease surveillance, evaluation of health programmes and community diagnosis
- Conduct epidemic investigations, spot maps, predict disease trends, preparation of reports, planning and implementation of control measures
- Demonstrate clinical skills of preparing case history, examination, provisional diagnosis, treatment and clinical case management and interpretation of laboratory findings. Conduct common procedures such as incision, drainage, dressings & injections.
- Do data collection, compilation, tabular and graphical presentation, analysis and interpretation, applying appropriate statistical tests, using computer-based software application for validation of findings
- Conduct epidemiological research studies to establish cause-effect relationships in elaborating the epidemiology of diseases and health events
- Develop appropriate IEC Material, assessment of community communication needs, training skills, counseling skills, conduct Health Education Programmes in urban and rural settings
- Conduct dietary surveys, assessment of nutritional status, nutritive values of common food menus, detection of food adulterants, use of lactometer, recording and interpretation of growth and development charts.
- Use and apply various instruments and processes concerned with environmental health and biological waste management eg. waste collection, segregation and disposal as per protocols, needle-disposers, disinfection procedures. Also use of Dosi-meters, Kata / Globe Thermometer, Slings Psychrometer, Gobar Gas Plant, Soakage pit, Solar Energy, functioning of ILRs, Deep Freezers, Cold Boxes, Vaccine Carriers.
- identify different types of mosquitoes, detect vector breeding places and orientation of the methods of elimination of breeding places and placement of a mosquito-proof water tank.
- Conduct clinical screening of various diseases and organize community health camps involving community participation in urban and rural settings. Use of Snellen charts for vision, Ischiara's chart for colour blindness, tourniquet tests for dengue diagnosis in fever, BMI and other physical measurements of infants, children and adults etc., copper-T insertions and preparation of pap smear.
- Conduct tests for assessment of chlorine demand of water (Horrock's Apparatus), procedure of well-water and urban water-tank chlorination, assessment of chlorination levels, physical examination of water, methods domestic water purification, oriented in use of water filters.
- Prepare health project proposals with budgeting based on the project objectives.

Miscellaneous skills: (The student should be able to)

1. Devise appropriate health education messages for public health awareness using various health communications strategies.

2. Identify family level and community level interventions and facilitate the implementation of the same e.g. food hygiene, food storage, cooking demonstrations, community kitchen, kitchen garden, empowerment of women for promoting nutritional health etc.
3. Demonstrate counselling skills for family planning services.
4. Plan and execute BCC strategy for individuals.
5. Conduct measurement of occupational exposure to harmful influences.
6. Diagnose occupational hazards and undertake surveys to identify occupational exposures as and when necessary.
7. Elicit appropriate response at individual and community level to prevent occupational hazards including IEC activities at different levels.
8. Use modern IT applications especially internet & internet-based applications.

Syllabus

Course contents:

1. Conceptual (and applied) understanding of Public Health, Community Medicine, clinical disease-oriented approach, Preventive approach & Health promotion, disease control & promotion.

Learning objectives:

At the end of this course topic, the student should be able to:-

i. Understand and explain the concept & application and give suitable analogies/examples related to Public Health/Community Medicine (with differences), Disease-oriented v/s Preventive approach, health promotion disease control & prevention.
ii. Explain correlation between health and human development with analogies/ examples.
iii. Explain concept of Primordial, Primary, Secondary and Tertiary prevention with examples.
v. Evolutionary History and mile-stones in Public Health – National and International levels.

2. Communicable and Non-Communicable diseases, emerging and re-emerging diseases

Learning objectives:

At the end of this course, the student should be able to:-

i. Understand and explain Epidemiology of Communicable/Non-communicable diseases- its causes, precipitating factors, social & other non- health causes, mechanisms of transmission, signs/systems, management, control & prevention measures, related national Health Programmes & national Guidelines, Directives, special projects, if any.
ii. Explain application of Disease surveillance system in control of Communicable/Non-communicable diseases.
iii. Explain & undertake steps to investigate & control outbreaks, epidemics and take measures to prevent the same.
iv. Evolve prevention & control measures based on local & regional epidemiological funding, synchronizing with National guidelines.

3. Applied Epidemiology, Health research, Bio-statistics

Learning objectives:

At the end of this course, the student should be able to:-

i. Explain the concept & application of Epidemiology of Disease and Health giving suitable examples.

ii. Explain Epidemiological approach, the terms Distribution & Determinants, uses, types of Epidemiological studies, interpretation, merits/demerits and limitations, odds ratio, relative risk, attributable & population attributable risks, Hybrid designs (with examples), validity of Epidemiological Data and application in practice at field level.

iii. Explain Epidemiological Research methods, Research related protocols, Literature review, estimating sample size, data collection/ compilation/Analysis/ Research, interpretation.

iv. Develop Health interventional programs based on Epidemiological Finding & create evidence for Public Health action.

v. Understand difference between data, information & intelligence, types of data, survey methods, formulating questionnaires, interview schedule, data presentation types & analysis.

vi. Apply computer based software application for data designing, data management & collation analysis e.g. SPSS, Epi-info, MS office and other advanced versions.

4. Nutrition

Learning objectives:

At the end of this course, the student should be able to:-

i. Identify various nutritional problems in the region, state and country and contributing factors for the same, with due emphasis on ecology perspectives.

ii. Explain importance of various nutrients (including micronutrients) in health, their sources, requirements and problems associated with their deficiencies as well as over consumption.

iii. Plan balanced diet and dietary requirements of various age and sex groups.

iv. Dietary/nutritional concerns of vulnerable groups – young children, adolescents, ANC/PNC/Lactating mothers/senior citizens/individuals with various health problems e.g hypertension, diabetes, renal problems etc.

v. Classification of food, food additives, food fortification, food enrichment, food toxins and food adulteration.

vi. Explain Food production, Food hygiene and safety, food storage, food preparation, food wastage and feeding practices.

vii. Assessment of nutritional status of a community by adopting different methodologies.

viii. Nutritional supplementation, surveillance, education and rehabilitation.

ix. National programmes in nutrition and their evaluation

x. National nutrition policy.

5. Environmental health

Learning objectives:

At the end of this course, the student should be able to:-

i. Highlight importance of external environment (air, water, noise, radiation, temperature, ventilation, solid waste disposal, insects and vectors, domestic and country yard pests, industrial waste disposal etc. and its impact on ecology and human health.
ii. Elaborate on health issues related to housing, air, water, noise, radiation pollution i.e. size of problems, area and specific groups affected, measurement of pollution levels and health impact of the same, corrective measures
iii. Elaborate on requirements of water, water chlorination and household purification measures, measurement of chlorine demand, Break-point chlorination levels, water quality.
iv. Assessment of quality of water and air, control of air pollution
v. Explain environmental sanitation and control measures (including appropriate technologies) – modern methods of sewage disposal, mechanical ventilation, soakage pits, gobar gas plants, smokeless Chula, solar energy, rainwater harvesting, sewage water recycling plants at society level etc.
vi. Explain global warming and its health impact.
vii. Elaborate on forest reserves, social forestry and health
viii. Study vectors of medical importance and integrated control measures against them.
ix. Explain dynamics of transmission of vector borne diseases
x. Explain pest control measures
xi. Explain environmental health issues in urban and rural areas
xii. Understand functioning of public sector measures to safeguard environmental health e.g water purification plant
xiii. Explain Legislative measures for protection of environmental health

6. Primary Health Care System, Panchayat Raj, National Health Programmes including RCH, Demography & Family Welfare:

Learning Objectives

At the end of this course, the student should be able to:-

i. Explain the meaning of Primary Health Care with suitable analogies with reference to India, and be able to define the systems approach for implementation of Primary Health Care.
ii. Enumerate the elements, principles, population coverage norms, staff patterns, day to day activities, programme schedule, stakeholders at PHC level.
iii. Explain the scope and implications of 3-tier system of Primary Health Care.
iv. Understand functioning of Rural Panchayat Raj system of development and its co-relation with health.
v. Promote community participation in Primary Health Care programme and motivate various stakeholders for the same.
vi. Understand and comply with medico-legal procedures related to Primary Health Care activities.
vii. Integrate, coordinate both health and non-health sectors for implementing various national health programmes.

viii. Deliver the provisions of various health schemes to eligible be beneficiaries such as Janani Suraksha Yojana, Rashtriya Swasthya Beema Yojana, Rajiv Gandhi Jeevandayi Arogya Yojana etc.

ix. Impart training in health programmes for paramedical workers, lab technicians, community health volunteer's, interns and provide health education in the community.

x. Implement Public Health Skills for investigations and containment of outbreaks & epidemics.

xi. Understand history of evolution of public health, important milestones in the world and in India.

xii. Enumerate the various health committees established and their major recommendations since 1947-48 to till date.

7. Health Care Administration, Health Management and Public Health Leadership

Learning Objectives:

At the end of this course, the student should be able to:-

i. Explain the conceptual difference between Administration and Management, Power and Authority with reference to health care.

ii. Explain the role of fundamental principles of constitution, principles of Democracy and its correlation with health care administration.

iii. Explain the role of Bureaucracy, Technocracy, Political system, Judiciary, Media and people in health care administration.

iv. Explain and identify the key positions and their role in health administration at State, District, Taluka (Tehsil block) and village level.

v. Explain the frame work of health care system at State, District, Taluka & village level and understand the mechanism of coordination between bureaucrats, technocrats, political, judiciary and media at each of these levels.

vi. Enumerate functions of a manager, explain concepts of management and leadership styles, various management techniques, planning process, monitoring & evaluation skills.

vii. Should be sensitive to quality issues in health care management and comply with relevant quality management techniques.

viii. Formulate and manage team approach for implementing health programmes.

ix. Apply skills of effective human resource management and identify relevant roles, responsibilities and duties of functionaries.

x. Implement skills of motivation, communication, negotiation and conflict management at PHC level.

xi. Develop budgetary statements based on evidence of needs assessment and be able to maintain account of expenditure as per norms.

xii. Undertake community health needs survey, conduct training & communication needs assessment of paramedical and health workers, identify vulnerable, underprivileged communities, implements high risk approach.

8. Health Policy, Medical Education, Integrating Alternative system of Medicine

Learning Objectives

At the end of this course, the student should be able to:-

i. Understand and elaborate implications of the policy provision with reference to the current health scenario in the country.
ii. Explain the role of health policy in promotion of Primary Health care, ensuring equity, inter-sectoral co-ordination, appropriate technology and community participation.
iii. Explain the various provisions for promotion of preventive and curative health services including National Health Mission, National Health Programs, Quality Hospital based services, Medical Education and AYUSH.
iv. Critically appreciate merits and demerits of the Health Policy.
v. Explain SWOT analysis of the policy and debate on evidence based recommendations, additions, deletions.
vi. Debate on suggestions or recommendations for future inclusions.

9. Social and behavioral sciences

Learning objectives:

At the end of this course, the student should be able to:-

i. Understand influence of social and behavioral practices on health.
ii. Understand principles of behavior change of an individual and community. Clearly understand difference between knowledge, attitude and practices..
iii. Understand importance of social medicine and health.
iv. Importance of behavior change communication (BCC).
v. Socio-cultural factors influencing behavior change.
vi. Formal and informal organizations in the community.
vii. Influence of peer pressure.
viii. Know the health problems, where BCC interventions are necessary.
ix. Understand factors promoting and detrimental to BCC.

11. Public Health Legislations

Learning objectives:

At the end of this course, the student should be able to:-

i. Explain public health legislations and need for the same.
ii. Know in detail each public health law – when, why, implementation, impact, issues etc.
iii. Enforcement of various public health laws.
iv. Judiciary mechanism for ensuring proper implementation of public health laws.
v. Scope for integrated approach for implementation of public health laws.

12. International Health

Learning Objectives:

At the end of this course, the student should be able to:-

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i. Understand the need and scope for international health measures.
ii. Enlist and understand functioning of various UN agencies (including WHO) playing key role in international health.
iii. Enlist and understand functioning of bilateral vs multilateral international donor agencies.
iv. Provide advice to international travelers and vaccination requirements,
v. Understand International health control measures e.g. quarantine, airport management etc.
vi. Understand the management of international ports from health perspectives.

13. Occupational Health

Learning Objectives:

At the end of this course, the student should be able to:-

i. Understand the concept of occupational health and its importance, Occupational environment and work dynamics.
ii. Know different types of occupational exposures at various settings.
iii. Enlist various occupational hazards and their relative magnitude.
iv. Understand measurement of exposure levels to harmful influences during occupation.
v. Understand preventive and control measures against various occupational hazards – global, national and local level measures.
vi. Understand individual and community responses towards preventing exposure to occupational hazards.
vii. Understand and advise occupational safety measures.
viii. Understand legislative measures to prevent exposures to occupational hazards.
ix. Advise compensation provisions to persons exposed to various occupational hazards.
x. Understand occupational health problems amongst people in unorganized sector
xi. Understand and advise social security and welfare provisions for workers – ESIS, Factory's Act, Role of ILO, Ministry of Labor, DGFASLI.

14. The recent advances in Public Health & miscellaneous issues

Learning Objectives:

At the end of this course, the student should be able to:-

i. identify & enlist events at local, district, national & global levels influencing or adversely affecting health /medical issues of the population.
ii. Adopt & practise skills related to utilization of modern technology, software, IT application in the interest of health promotion & disease prevention.

15. Health Economics

Learning Objectives:

At the end of this course, the student should be able to: -

i. Describe the scope of health economics.

ii. Understand health market & its characteristics.
iii. Understand & apply economic evaluation techniques.
iv. Assess the mechanism of Funding Health Care services, especially health insurance.
v. Advise on alocation of resources appropriately in their work area.

TEACHING AND LEARNING METHODS

Teaching methodology

The following is a rough guideline to various teaching/learning activities that may be employed:

- **Journal Club :** Critical appreciation and discussion of research articles in indexed journals
- **Seminar**
- **Lecture/Discussion :** Lectures on newer topics by faculty
- **Case presentation :** Communicable disease case presentation (focus on epidemiology, control, prevention) or Family case (focus on health needs assessment, SWOT analysis of family, social determinants and social empowerment, community management, role of primary health care and mobilizing resources for empowerment of the family). PG students will present the cases in presence faculty and discuss various modalities of management.
- **Public Health Management training** in Immunization clinics, Disease Surveillance Units, General Preventive OPD, hands-on training in management of national health programs at urban health centre and rural health centre along with orientation in health administrative system.
- The PG student shall be required to participate in the teaching and training programme of Undergraduate students and interns.
- The PG student must have attended Mandatory training in Research Methodology during his tenure.
- A postgraduate student of a postgraduate degree course in broad specialities/super specialities would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.
- Special Seminars / Workshops: conducted by External Faculty on cross-cutting subjects directly or indirectly concerned with Health. eg. Critical appreciation of National Developmental Budget, delivered by prominent Economist.
- **Log Book:** Postgraduate students shall maintain a log book of the work carried out by them and the training programme undergone during the period of training including details of work experience during their postings, including programs implemented under supervision and those performed independently. The log book shall be checked and assessed periodically by the faculty members imparting the training.
- Department should encourage e-learning activities.
- **Postings are given below:**

Recommended schedule for three years training:

Orientation Training/Field postings
for students of MD Community Medicine

No.	Field Posting and work	Duration
01	Posting at Sub-centers & PHCs Under & at RHTC and UHTC attached to Dept of Community Medicine as per MCI norm	Total period of ONE year during the 3 year period of PG course. Posting at RHTC should be residential.
02	Posting in the teaching hospital for exposure to clinical departments namely Pediatrics, OBGY & General medicine to acquire clinical skills for diagnosis and management of Communicable and Non-Communicable Diseases	Total - One month General Medicine-2 wks Pediatrics -1 wk Ob. & Gy. -1 wk Time of posting shall be at the discretion of local feasibility
03	Work attachment to gain hands- on skills based, training in public health department & orientation in Health Administration and Management of various National Health Programmes and aspects of public health management at the offices of the DHO/DHS/THO/DTO/DMO/CDPO/MOH of Local Civic Body or district health authorities.	Total - One month Place & time of 2 postings of 2 wks each shall be at discretion of local feasibility.
04	Short duration posting in various camps, melas, public health emergencies, investigation of epidemics, implementation of NHP, linen dept of hospital, Hospital kitchen, Hospital record section, central drug store, Medical Supdt. Office, blood bank, casualty dept., CCL, Hospital waste management, ART-VCTC, Matron Office (HRD), HMIS etc.	Total - one month Minimum of four postings of 1wk duration each shall be done subject to local feasibility.
05	Visits to various institutions of Public Health Importance	Subject to local feasibility

During the training programme, patient safety is of paramount importance; therefore, skills are to be learnt initially on the models, later to be performed under supervision followed by performing independently; for this purpose, provision of skills laboratories in medical colleges is mandatory.

ASSESSMENT

FORMATIVE ASSESSMENT, ie., during the training may be as follows:

Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self directed learning and ability to practice in the system.

Quarterly assessment during the MD training should be based on:

1. Journal based / recent advances learning

2. **Patient based /Laboratory or Skill based learning**
3. **Self directed learning and teaching**
4. **Departmental and interdepartmental learning activity**
5. **External and Outreach Activities / CMEs**

The student to be assessed periodically as per categories listed in postgraduate student appraisal form (Annexure I).

SUMMATIVE ASSESSMENT, ie., at the end of training

The summative examination would be carried out as per the Rules given in POSTGRADUATE MEDICAL EDUCATION REGULATIONS, 2000.

The examination shall be in three parts:

1. **Thesis**

   Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination. The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination. A post graduate student shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners.

2. **Theory Examination:**

The Post Graduate examination shall be in three parts: -

1. **Thesis:** It should be submitted to the University by each post graduate student at least 6 months before the theory and clinical/practical examination. The thesis shall be examined by a minimum of three examiners, one internal and two external examiners, appointed by the university and who shall not be the examiners for theory and practical. A post graduate student shall be allowed to appear for the theory and practical/clinical examination only after the acceptance of the thesis by two examiners.

2. **Theory**:

   The examinations shall be organised on the basis of 'Grading'or 'Marking system' to evaluate and to certify post graduate student 's level of knowledge, skill and competence at the end of the training. Obtaining a minimum of 50% marks in 'Theory' as well as 'Practical' separately shall be mandatory for passing examination as a whole. The examination for M.D./ MS shall be held at the end of 3rd academic year. An academic term shall mean six month's training period**.**

   There shall be four theory papers as follows:

   Paper I : Conceptual (and applied) understanding of Public Health, Community Medicine, Communicable and Non- Communicable diseases, emerging and re-emerging diseases, Applied Epidemiology, Health research, Bio-statistics.

Paper II: Nutrition, Environmental Health, Primary Health Care system, Panchayat Raj system, National health Programs, RCH, Demography and Family Welfare, Health Care Administration, Health Management and Public Health Leadership.

Paper III: Social & Behavioral sciences- applied aspects, Scientific communications & Medical writing, Research Methodology, Public Health Legislations, International Health & Global Diseases surveillance.

Paper IV: Health Policy planning, Medical Education technology, Information Technology, Integration of alternative Health system including AYUSH, Occupational Health, Recent advances in Public Health & Miscellaneous issues, Health Economics.

Practical/Clinical and oral examination:

The practical examination should be conducted over two days, not more than 8 post graduate students per batch, per day as follows :

1. **One long Family case from the community**:

   Socio-economic, demographic, cultural and holistic history taking, of the family to understand the various risk factors affecting health and quality of life, assessment of social support system, assessment of present morbidity and its implications, evolve interventions for medical relief and social empowerment and role of family, community and primary health care system in resolving family issues. This shall be conducted preferably in the community setting.

2. **One long Case (30 minutes), 2 short cases (20 minutes each) – Cases with Communicable Diseases**

   Students will elaborate on clinico-epidemiological case history to assess the epidemiological factors, precipitating factors, probable source of infection and evolve measures for diagnosis, treatment, management with reference to the case as well as major public health concerns, i.e. Control, prevention of the diagnosed disease and interventions in case of eminent outbreak / epidemic situations. Short cases may be assessed without presentation of detailed history, beginning with Differential Diagnosis in the given time.

3. **Epidemiology and Statistics problem-solving exercises (5):**
   (Epidemiological – 3, Statistical – 2)

4. **Public Health Spots (5) :** including interpretation of analytical reports of water, food, environmental assessment and public health micro-biology

5. **Viva-voce Examination**

   Oral/ Viva-Voce Examination shall be comprehensive enough to test the post graduate student's overall knowledge of the subject.

Recommended reading:

A. Books (latest edition)

1. *Public Health and Preventive Medicine* (Maxcy-Rosenau-Last Public Health and Preventive Medicine) by Robert B. Wallace
2. *Basic Epidemiology*. R Bonita, R Beaglehole, T Kjellstrom. World Health Organization Geneva.
3. *Epidemiology,* by Leon Gordis.
4. *Oxford Textbook of Public Health.* Holland W, Detel R, Know G.
5. *Practical Epidemiology*, by D.J.P Barker
6. *Park's Textbook of Preventive and Social Medicine*, by K.Park
7. *Principles of Medical Statistics,* by A. Bradford Hill
8. *Interpretation and Uses of Medical Statistics,* by Leslie E Daly, Geoffrey J Bourke, James MC Gilvray.
9. *Epidemiology, Principles and Methods*, by B. MacMahon, D. Trichopoulos
10. *Hunter's Diseases of Occupations*, by Donald Hunter, PAB Raffle, PH Adams, Peter J. Baxter, WR Lee.
11. *Epidemiology and Management for Health Care,*, by Sathe PV and Doke PP.
12. *Vaccines*, by Stanley A. Plotkin.
13. All reports and documents related to all National Programmes from the Ministry of Health and Family Welfare.

B. Journals

03-05 international Journals and 02 national (all indexed) journals

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Annexure I

Postgraduate Students Appraisal Form

Pre / Para /Clinical Disciplines

Name of the Department/Unit :

Name of the PG Student :

Period of Training : FROM.....TO.....

Sr. No.	PARTICULARS	Not Satisfactory	Satisfactory	More Than Satisfactory	Remarks
		1 2 3	4 5 6	7 8 9	
1.	Journal based / recent advances learning				
2.	Patient based /Laboratory or Skill based learning				
3.	Self directed learning and teaching				
4.	Departmental and interdepartmental learning activity				
5.	External and Outreach Activities / CMEs				
6.	Thesis / Research work				
7.	Log Book Maintenance				

Publications **Yes/ No**

Remarks*_____

_____

_____

***REMARKS: Any significant positive or negative attributes of a postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.**

SIGNATURE OF ASSESSEE **SIGNATURE OF CONSULTANT** **SIGNATURE OF HOD**

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COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR MD IN DERMATOLOGY, VENEREOLOGY & LEPROSY

Preamble:

The purpose of PG education is to create specialists who would provide high quality health care and advance the cause of science through research & training.

A post graduate specialist having undergone the required training should be able to recognize the health needs of community, should be competent to handle effectively the medical problems and aware of recent advances pertaining to the discipline. The PG student should acquire basic skills in teaching medical/para-medical students. The student should be able to counsel patients and relatives in infectious diseases like HIV/AIDS, STDs, cutaneous tuberculosis, leprosy and any event of serious illness or death.

The purpose of this document is to provide teachers and learners illustrative guidelines to achieve defined outcomes through learning and assessment. This document was prepared by various subject-content specialists. The Reconciliation Board of the Academic Committee has attempted to render uniformity without compromise to purpose and content of the document. Compromise in purity of syntax has been made in order to preserve the purpose and content. This has necessitated retention of “domains of learning” under the heading “competencies”.

SUBJECT SPECIFIC OBJECTIVES

At the end of 3 years of post graduate training in Dermatology, Venereology & Leprosy:

- Student should have knowledge of basic sciences (Anatomy, Physiology, Biochemistry, Microbiology, Pathology and Pharmacology) as applied to dermatology. The student should acquire in-depth knowledge of his subject including recent advances. The student should be fully conversant with the bedside procedures (diagnostic and therapeutic) and having knowledge of latest diagnostics and therapeutics available.
- Student should have acquired practical and procedural skills related to the subject.
- Critically evaluate, initiate investigation and clinically manage cases in Dermatology, Venereology and Leprosy with the help of relevant investigations.

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- Should plan and advise measures for the prevention and rehabilitation of patients with various dermatological conditions.
- Able to ensure the implementation of National Health Programmes, particularly in sexually transmitted diseases (STD) and leprosy.
- Acquire training skills in research methodology, professionalism, attitude and communication skills, as below:
    - Student must know basic concepts of research methodology, plan a research project, consult library and online resources, has basic knowledge of statistics and can evaluate published studies.
    - Should be able to practice the specialty of dermatology ethically.
    - Recognize the health needs of patients and carry out professional obligations in keeping with principles of National Health Policy and professional ethics.
- Teaching skills in the subject
    - Student should learn the basic methodology of teaching and develop competence in teaching medical/paramedical students.
- Should have acquired Problem Solving skills

SUBJECT SPECIFIC COMPETENCIES

By the end of the course, the student should have acquired knowledge (cognitive domain), professionalism (affective domain) and skills (psychomotor domain) as given below:

A. Cognitive domain

At the end of the course, the student should have acquired following theoretical competencies:

- Describe structure, functions and development of human skin.
- Describe ultrastructural aspects of epidermis, epidermal appendages, dermo-epidermal junction, dermis, and sub-cutis.
- Describe basic pathologic patterns and reactions of skin.
- Demonstrate the knowledge of common laboratory stains and procedures used in the histopathologic diagnosis of skin diseases and special techniques such as immunofluorescence, immunoperoxidase and other related techniques.
- Describe the basics of cutaneous bacteriology, mycology, virology, parasitology and host resistance.
- Describe papulosqamous and vesiculobullous disorders.
- Describe disorders of epidermal appendages and related disorders.
- Describe inflammatory and neoplastic disorders of dermis.
- Describe skin lesions in nutritional, metabolic and heritable disorders.

- Describe pharmacokinetics and principles of topical and systemic therapy.
- Describe drug reaction, its diagnosis and management.
- Describe cutaneous manifestations of systemic disorders.
- Describe anatomy of male and female genitalia, epidemiological transmission, clinical aspects and management of STDs and HIV.
- Describe clinical features, reactions, treatment and rehabilitation in leprosy.
- Describe etiology, pathophysiology, principles of diagnosis and management of common problems in dermatology including emergencies in adults and children.
- Describe indications and methods for fluid and electrolyte replacement therapy including blood transfusion in dermatological conditions.
- Describe common dermatological malignancies in the country and their management including prevention.
- Should be expert in evaluation of ECG, chest X-ray (CXR), biochemical, haematology and immunology reports related to dermatology.
- Acquire knowledge of common laboratory stains and procedures used in the histopathologic diagnosis of skin diseases and special techniques such as immuno-fluorescence, immuno-peroxidase and other related techniques.
- Acquire knowledge of the basics of laser operation and precautions which needs to be taken.
- Demonstrate competence in basic concepts of research methodology and interpretation of data in medical literature/publications.
- Skilled as a self-directed learner, recognize continuing educational needs; use appropriate learning resources and critically analyze relevant published literature in order to practice evidence-based dermatology;
- Should also have a broad idea how to approach an uncommon dermatological disease.

B. Affective Domain

At the end of the course, the student should have acquired the following attitudinal competencies:

- Demonstrate self-awareness and personal development in routine conduct.
- **Behavior and Emotional Stability:** Dependable, disciplined, dedicated, stable in emergency situations and shows positive approach.
- **Motivation and Initiative:** Is innovative, enterprising,does not shirk duties or leave any work pending and motivates team members.
- **Honesty and Integrity:** Is truthful, admits mistakes, does not cook up information, has ethical conduct and exhibits good moral values.
- **Interpersonal Skills and Leadership Quality:** Has compassionate attitude towards patients and attendants, gets on well with colleagues and paramedical staff, is respectful to seniors, has good communication skills.

- Should be able to maintain confidentiality with regards to history, physical examination and management of patients.
- Identify social, economic, environmental, biological and emotional determinants of patients, and institute diagnostic, therapeutic, rehabilitative, preventive and promotive measures to provide holistic care to patients at individual and community level against skin, venereal disease and leprosy.
- Recognize the emotional and behavioral characteristics of patients and keep these fundamental attributes in focus while dealing with them.
- Demonstrate empathy and humane approach towards patients and their families and respect their sensibilities.
- Demonstrate communication skills of a high order in explaining management and prognosis, providing counseling and giving health education messages to patients, families and communities.
- Organize and supervise the desired managerial and leadership skills.
- Should be able to function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the patient and the clinician or other colleagues to provide the best possible diagnosis or opinion.
- Always adopt ethical principles and maintain proper etiquette in dealings with patients, relatives and other health personnel and to respect the rights of the patient including the right to information and second opinion.

C. Psychomotor Domain

A student at the end of training of 3 years of MD programme, must acquire the following practical skills:

- General medical skills as learnt in MBBS to be maintained:
    - Should be able to provide basic life support (BLS).
    - Should be expert in blood pressure measurement, intravenous access, blood sampling, fluid electrolytes therapy, plerual and cerebrospinal; fluid (CSF) fluid examination.
    - Should be able to provide basic and advanced life-saving support services in emergency situations.
    - Should be able to undertake complete monitoring of the patient and identify social, economic, environmental and emotional determinants in a given case and take them into account for planning therapeutic measures.
- Recognize conditions that may be outside the area of his specialty/competence and refer them to the proper specialist.

Dermatology, Venereology and Leprosy, HIV/AIDS Skills

The student should:

- Acquire skills in history taking, physical examination, diagnosis and management of patients in dermatology, venereology and leprosy.
- Be able to identify, classify and differentiate cutaneous findings in dermatological terms in a systematic way.
- Be able to perform systemic examination (chest, cardiac, abdomen, neurological, genitals, oral, eye and gynaecological examination) relevant to dermatologic condition.
- Be competent to manage dermatologic emergencies like angioedema, toxic epidernmal necrolysis (TEN), Stevens-Johnson syndrome (SJS), pemphigus, drug reaction and necrotic erythema nodosum leprosum (ENL).
- Be able to plan and deliver comprehensive treatment for diseases using principles of rational drug therapy.
- Be able to plan and advice measures for the prevention of infectious disease.
- Be able to plan rehabilitation of patient suffering from chronic illness and disability and those with special needs like leprosy.
- Demonstrate skills in documentation of case details and of morbidity/mortality data relevant to the assigned situation.

Laboratory Skills

The student:

- Should be able to perform common laboratory procedures like potassium hydroxide (KOH) mount, Gram stain, Giemsa stain, acid fast bacilli (AFB) stain, Woods lamp examination, stains,culture media etc. related to the cutaneous diagnosis independently.
- Should be able to order relevant investigations and interpret them to reach to a diagnosis.
- Should be familiar with other recent investigations.

Dermatopathology - Student should be competent enough to:

- To interpret histopathology of common skin diseases.
- To diagnose common skin diseases by examining slides under microscope.

Surgery in dermatology

At the end of training following skills should be performed independently by the student:

1. Should able to give incisions, take stitches and sutures.
2. Should be trained in taking skin biopsy and nail biopsy.
3. Should be able to perform chemical peels, manual dermabrasion, skin punch grafting and wound dressing independently.

4. Should be able to perform cryosurgery, nail surgery and acne surgery.
5. Able to perform chemical cauterization, cryotherapy, patch and photopatch test, slit smears and tissue smears.

Venereology

1. Should be competent in the clinical approach to the patient of STDs and HIV/AIDS.
2. Should be able to interpret the histopathological diagnosis including laboratory aids related with venereology.
3. Able to perform dark ground illumination, gram stain, Bubo aspiration and tissue smear.
4. Able to manage the patient according to syndromic approach for treatment of STDs.

Leprosy

The student should be:

1. Able to diagnose and approach the case of leprosy.
2. Perform AFB smear.
3. Able to manage cases of lepra reaction.
4. Identify, judge and decide when to refer the patients at appropriate level for surgery or rehabilitation.Should able to manage pediatric cases with skin diseases.

Syllabus

Course contents

Topics related to allied basic sciences

- The structure, functions and development of human skin.
- Ultrastructural aspects of epidermis, epidermal appendages, dermo-epidermal junction, dermis, and sub-cutis.
- Immunology, molecular biology and genetics in relation to the skin.
- Epidermal cell kinetics and keratinization.
- Lipids of epidermis and sebaceous glands.
- Percutaneous absorption.
- Skin as an organ of protection and thermoregulation.
- Biology of eccrine and apocrine sweat glands.
- Biology of melanocytes and melanin formation.
- Biology of hair follicles, sebaceous glands and nails.
- Epidermal proteins.
- Dermal connective tissue: collagen, elastin, reticulin, basement membrane and ground substance.
- Metabolism of carbohydrates, proteins, fats and steroids by the skin.
- Cutaneous vasculature and vascular reactions.

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- Mechanism of cutaneous wound healing.
- Cellular and molecular biology of cutaneous inflammation and arachidonic acid metabolism.
- Immunologic aspects of epidermis.
- Human leukocyte antigen (HLA) system.
- Immunoglobulins.
- Cytokines and chemokines.
- Lymphocytes, neutrophils, eosinophils, basophils and mast cells.
- Complement system.
- Hypersensitivity and allergy.
- Cutaneous carcinogenesis (chemical, viral and radiation).
- Basics of cutaneous bacteriology, mycology, virology, parasitology and host resistance.
- Common laboratory procedures, stains,culture media etc. related to the cutaneous diagnosis.
- Basic pathologic patterns and reactions of skin.
- Common laboratory stains and procedures used in the histopathologic diagnosis of skin diseases and special techniques such as immunofluorescence, immunoperoxidase and other related techniques**.**

Clinical dermatology

- Epidemiology of cutaneous disease.
- Psychologic aspects of skin disease and psycho-cutaneous disorders.
- Pathophysiology and clinical aspects of pruritus.

Papulosquamous diseases

- Psoriasis, pityriasis rubra pilaris, pityriasis rosea.
- Parapsoriasis, lichen planus, lichen niditus.
- Palmo-plantar keratodermas, Darier’s disease, porokeratosis.
- Ichthyoses and ichthyosiform dermatoses.
- Kyrle’s disease and other perforating disorders.

Vesiculo - bullous disorders

- Erythema multiforme, Stevens-Johnson syndrome, Toxic epidermal necrolysis.
- Bullous pemphigoid, Pemphigus.
- Chronic bullous disease of childhood.
- Herpes gestationis (pemphigoid gestationis).
- Hereditary epidermolysis bullosa.
- Epidermolysis bullosa acquisita.
- Dermatitis herpetiformis.
- Familial benign pemphigus.

- Subcorneal pustular dermatoses.
- Pustular eruptions of palms and soles.

Disorders of epidermal appendages and related disorders

- Disorders of hair and nails.
- Disorders of sebaceous glands.
- Rosacea, Perioral dermatitis, acne.
- Disorders of eccrine and apocrine sweat glands.
- Follicular syndromes with inflammation and atrophy.

Epidermal and appendageal tumours

- Precancerous lesions, squamous cell carcinoma and basal cell carcinoma
- Keratoacanthoma, benign epithelial tumours, appendageal tumours
- Merkel cell carcinoma, Paget's disease

Disorders of melanocytes

- Disorders of pigmentation, albinism, benign neoplasia and hyperplasias of melanocytes, dysplastic melanocytic nevi, cutaneous malignant melanoma.

Inflammatory and neoplastic disorders of the dermis

- Acute febrile neutrophilic dermatosis (Sweet's syndrome)
- Erythema elevatum diutinum
- Cutaneous eosinophilic diseases
- Granuloma faciale
- Pyoderma grangrenosum
- Erythema annulare centrifugum and other figurate erythemas
- Granuloma annulare
- Malignant atrophic papulosis (Dego's Disease)
- Neoplasms, pseudoneoplasms and hyperplasias of the dermis
- Vascular anomalies
- Kaposi's Sarcoma
- Anetoderma and other atrophic disorders of the skin
- Ainhum and pseudoainhum
- Neoplasias and hyperplasias of neural and muscular origin
- Elastosis perforans serpiginosa and reactive perforating collagenosis

Lmphomas, pseudolymphomas and related conditions

Disorders of subcutaneous tissue

- Panniculitis

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- Lipodystrophy
- Neoplasms of the subcutaneous fat

Disorders of the mucocutaneous integument

- Biology and disorders of the oral mucosa
- Disorders of the anogenitalia of males and females

Cutaneous changes in disorders of altered reactivity

- Genetic immunodeficiency diseases
- Urticaria and Angioedema
- Disorders associated with complement abnormalities
- Graft-versus-host Disease
- Muco-cutaneous manifestations in immunosuppressed host other than HIV-infection
- Contact dermatitis
- Auto-sensitization dermatitis
- Atopic dermatitis (atopic eczema)
- Nummular eczematous dermatitis
- Seborrhoeic dermatitis
- Vesicular palmoplantar eczema

Skin changes due to mechanical and physical factors

- Occupational skin disease
- Radiobiology of the skin
- Skin problems in amputee
- Sports dermatology
- Skin problems in war field
- Decubitus ulcers

Photomedicine, photobiology and photo immunology in relation to skin

- Acute and chronic effects of ultraviolet radiation and sun light on the skin
- Narrow-band ultraviolet B (NBUVB) therapy, phototherapy, photochemotherapy

Disorders due to drugs and chemical agents

- Cutaneous reactions to drugs
- Mucocutaneous complications of anti-neoplastic therapy
- Cutaneous manifestations of drug abuse

Dermatology and the ages of man

- Neonatal dermatological problems
- Pediatric and adolescent dermatological problems

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- Ageing of skin
- Geriatric dermatological problems

Skin lesions in nutritional metabolic and heritable disorders

- Cutaneous changes in nutritional disease
- Acrodermatitis enteropathica and other zinc deficiency disorders
- Cutaneous changes in errors of amino acid metabolism: Tyrosinemia II, phenylketonuria, arginine succinic aciduria, and alkaptonuria
- Amyloidosis of the skin
- The porphyrias
- Xanthomatosis and lipoprotein disorders
- Fobry's Disease; galactosidase - a deficiency (Angiokeratoma corporis diffusum universale)
- Lipid proteinosis
- Cutaneous mineralisation and ossification
- Heritable disorders of connective tissue with skin changes
- Heritable disease with increased sensitivity to cellular injury
- Basal cell Naevus syndrome

Skin manifestations of hematologic disorders

- Skin changes in hematological disease
- Langerhans cell and other cutaneous histiocytoses
- The Mastocytosis syndrome

Skin manifestations of systemic disease

- The skin and disorders of the alimentary tract
- The hepatobiliary system and the skin
- Cutaneous changes in renal disorders, cardiovascular, pulmonary disorders and endocrinal disorders
- Skin changes and diseases in pregnancy
- Skin changes in the flushing disorders and the carcinoid syndrome

Skin manifestations of rheumatologic disease

- Lupus Erythematosus
- Dermatomyositis
- Scleroderma
- Systemic Necrotizing Arteritis
- Cutaneous Necrotising venulitis
- Cryoglobulinemia and Cryofibrinogenemia
- Relapsing Polychondritis
- Rheumatoid Arthritis, Rheumatic Fever and Gout

- Sjogren's syndrome
- Raynaud's phenomenon
- Reiter's syndrome
- Multicentric Reticulohisticytosis

Cutaneous manifestations of disease in other organ systems

- Sarcoidosis of the skin
- Cutaneous manifestations of Internal Malignancy
- Acanthosis Nigricans
- Scleredema
- Papular Mucinosis
- Neurocutaneous disease
- Tuberous Sclerosis Complex
- The Neurofibromatosis
- Ataxia Telangiectasia
- Behcet's disease

Bacterial diseases with cutaneous involvement

- General considerations of bacterial diseases
- Pyodermas: Staphylococcus aureus, Streptococcus, and others
- Staphylococcal Scalded-Skin syndrome
- Soft Tissue Infections: Erysipelas, Cellulitis, Septicemia and Gangrenous Cellulitis
- Gram-Negative Coccal and bacillary infections
- Bartonellosis
- Miscellaneous bacterial infections with cutaneous manifestations
- Tuberculosis and other myopacterial infections
- Actinomycosis, Necardiosis, and Actinomycetoma
- Lyme Borreliosis
- Kawasaki Disease

Fungal diseases with cutaneous involvement

- Superficial fungal infection: Dermatophytosis, Tinea Nigra, Piedra
- Yeast Infections: Candidiasis, Pitryiasis (Tinea) Versicolor
- Deep Fungal Infections

Viral and ricketisial disease

- Viral Diseases: general consideration
- Rubella (German Measles)
- Measles
- Hand, Foot and Mouth Disease
- Herpangina

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- Erythema Infectiosum and Parvovirus B 19 infection
- Herpes simplex
- Varicella and Herpes Zoster
- Cytomegalovirus Infection
- Epstein - Barr Virus Infections
- Human Herpes virus 6 & 7 infections and Exanthem subitum (Roseola Infantum or Sixth Disease)
- Smallpox and Complications of small pox vaccination
- Contagious Pustular Dermatitis, Contagious Ecthyma: Orf virus infection
- Milluscum Contagiosum
- Miller's Nodules
- Warts
- Human Retroviral Disease: Human T-Lymphotropic Virusviruses

Therapeutics

Topical therapy

- Pharmacokinetics principles intopical applications of drugs.
- Principles of topical therapy.

Topical agents

- Glucocorticoids, Acne therapies, Analgesics, Anesthetics, Anti-inflammatory, Anti hair loss, Anti-microbial, Anti-parasitic, Anti-perspirants, Anti-pruritic, Anti-viral, Astringents, Bleaching agents, Keratolytics, Psoriasis therapies, Wart therapies, Topical Retinoids, Topical Antibiotics, Topical Anti-fungal Agents, Sun-protective Agents, Keratolytic Agents, Topical Cytotoxic Agents, Cosmetics and Skin care in practice.

Systemic therapy

- Systemic glucocorticoids, Sulfones, Aminoquinolines, Cytotoxic and Antimetabolic Agents, Oral Retinoids, Antihistamines, Antibiotics, Antiviral Drugs, Oral Antifungal Agents, Immunosuppressive and Immunomodulatory drugs, Thalidomide, photo-chemotherapy and photo-therpay, electric cautery, cryotherapy, electrolysis, tattooing, intra-lesional injections etc.

Surgery in dermatology

- Dermatologic Surgery: Introduction and Approach
- Skin Resurfacing: Chemical Peels
- Skin Resurfacing: Dermabrasion
- Skin Resurfacing: Laser
- Skin punch grafting
- Wound Dressings
- Cryosurgery

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- Nail Surgery

Venereology

- Clinical approach to the patient of sexually transmitted disease
- Anatomy of male and female genitalia
- Epidemiological aspects of STDs
- Viral STDs including HIV, Herpes, Human Papilloma virus (HPV), Molluscum contagiosum, Espirito Santo virus (ESV) etc.
- Bacterial STD's: Syphilis, Gonorrhoea, Chancroid, Donovanosis
- Chlamydial infections: Lymphogranuloma venereum, urethritis, cervicits, nongonococcal urethritis (NGU), non-specific vaginitis etc.
- Fungal: Candidiasis
- Protozoal: Trichomoniasis
- Ectoparasitic: Scabies, Pediculosis infestations.
- Syndromic management of STDs
- HIV/AIDS - Epidemiology, transmission, patient load, High risk groups, cutaneous manifestations of HIV, treatment of opportunistic infections, antiretroviral therapy, management of STDs in HIV positive cases
- STDs in reproduction health and Pediatrics
- STDs and HIV
- Prevention, counselling and education of different STDs including HIV
- National Control Programmes of STDs and HIV infection
- Medico-legal, social aspects of STDs including psychological and behavioural abnormalities in STD patients

Leprosy

- Approach to the patient with leprosy
- Epidemiological aspects
- Structure, biochemistry, microbiology of Mycobacterium leprae
- Animal models
- Pathogenesis
- Classification
- Immunology and molecular biological aspects
- Histopathology and diagnosis including laboratory aids
- Clinical features
- Reactions
- Systemic involvement (Ocular, bone, mucosa, testes and endocrine etc.)
- Pregnancy and leprosy
- HIV infection and leprosy

TEACHING AND LEARNING METHODS

A post graduate student pursuing the course should work in the institution as a full time student. No candidate should be permitted to run a clinic/laboratory/nursing home while studying postgraduate course. Each year should be taken as a unit for the purpose of calculating attendance. Every student shall attend teaching and learning activities during each year as prescribed by the department and should not be absent from work without valid reasons**.**

Teaching methodology:

A list of teaching and learning activities designed to facilitate students acquire essential knowledge and skills outlined is given below.

1. **Lectures:** Lectures are to be kept to a minimum. They may, however, be employed for teaching certain topics. Lectures may be didactic or integrated.
   a) **Didactic Lectures**: Few topics are suggested as examples:
      1) Bio-statistics
      2) Use of library
      3) Research Methodology
      4) Medical code of Conduct and Medical Ethics
      5) National Health and Disease Control Programmes
      6) Communication Skills

   These topics may preferably be taken up in the first few weeks of the first year.
   b) **Integrated Lectures:** Some of the topics may be taken up by multidisciplinary teams eg. Jaundice, Diabetes mellitus, Thyroid etc.

2. **Journal Club & Subject seminars:** Both are recommended to be held once a week. All PG students are expected to attend and actively participate in discussion and enter relevant details in the Log Book. Further, every post graduate student must make a presentation from the allotted journal(s), selected articles at least four times a year. The presentations would be evaluated and would carry weightage for internal assessment.
3. **Student Symposium**: Recommended as an optional multi-disciplinary programme. The evaluation may be similar to that described for subject seminar.
4. **Ward Rounds:** Ward rounds may be service or teaching rounds.
   a) **Service Rounds:** Post graduate students and Interns should be responsible for everyday care of the patients. Newly admitted patients should be worked up by the PGs and presented to the seniors the following day.
   b) **Teaching Rounds:** Every unit should have 'grand rounds' for teaching purpose. A diary (log book) should be maintained for day to day activities by the students.

   Entries of (a) and (b) should be made in the Log book. Log books shall be checked and assessed periodically by the faculty members imparting the training.

5. **Clinical Case Presentations:** Minimum of 5 cases to be presented by every post graduate student each year. They should be assessed using check lists and entries made in the log book

6. **Clinico-Pathological Conference (CPC):** Recommended once a month for all post graduate students. Presentation is to be done by rotation. If cases are not available, it could be supplemented by published CPCs.

7. **Inter-Departmental Meetings:** Strongly recommended particularly with Departments of Pathology and Radio-Diagnosis at least once a week. These meetings should be attended by post graduate students and relevant entries must be made in the Log Book.

Pathology: A dozen interesting cases may be chosen and presented by the post graduate students and discussed. The staff of Pathology department would then show the slides and present final diagnosis. In these sessions, the advances in immuno-histochemical techniques can be discussed.

Radiodiagnosis: Interesting cases and imaging modalities should be discussed.

8. Teaching Skills: The post graduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.

9. The post graduate students should undertake audit, use information technology tools and carry out research, both basic and clinical, with the aim of publishing the work and presenting the same at various scientific fora.

10. Continuing Medical Education Programmes (CME): At least two CME programmes should be attended by each student during the MD programme.

11. Conferences: The student should attend courses, conferences and seminars relevant to the speciality.

12. A postgraduate student of a postgraduate degree course in broad specialities/super specialities would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.

13. Department should encourage e-learning activities.

14. Rotation:

C**linical Postings**

A major tenure of posting should be in the Department of Dermatology. It should include care of in-patients, out-patients, special clinics like STD clinic, leprosy clinic, vitiligo clinic and maintenance of case records for both in- and out-patients.

A short posting for 2-4 weeks in the Department of Medicine is to be arranged for exposure to Emergency Medicine and Resuscitation.

15. Clinical meetings:

There should be intra - and inter- departmental meetings for discussing uncommon / interesting medical problems. Each student must be asked to present a specified number of cases for clinical discussion, perform procedures/tests/operations/present seminars/review articles from various journals in inter-unit/interdepartmental teaching sessions. These should be entered in a Log Book; log books should be checked and assessed periodically by the faculty members imparting the training.

16. Thesis writing:

Thesis writing is compulsory. All MD students are required to carry out work on a selected research project under the guidance of a recognized post graduate teacher, the result of which shall be written up and submitted in the form of a Thesis.

During the training programme, patient safety is of paramount importance, therefore, skills are to be learnt initially on the models, later to be performed under supervision followed by performing independently; for this purpose, provision of surgical skills laboratories in medical colleges is mandatory.

ASSESSMENT

FORMATIVE ASSESSMENT, i.e., during the training may be as follows:

Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self directed learning and ability to practice in the system.

Quarterly assessment during the MD training should be based on:

1. Journal based / recent advances learning
2. Patient based /Laboratory or Skill based learning
3. Self directed learning and teaching
4. Departmental and interdepartmental learning activity
5. External and Outreach Activities / CMEs

SUMMATIVE ASSESSMENT, i.e., at the end of training

The summative examination would be carried out as per the Rules given in POSTGRADUATE MEDICAL EDUCATION REGULATIONS, 2000.

The examination shall be in three parts:

1. Thesis

Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination. The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination. A post graduate student shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners.

2. Theory Examination:

There shall be four papers each of three hours duration. Each paper shall consist of two long essay questions, three short essay questions and four short notes. These are:

Paper – I	**Basic Science as applied to Dermatology, STDs and Leprosy**
Paper – II	**Dermatology**
Paper – III	**STD & Leprosy**
Paper – IV	**Recent advances in field of Dermatology, Applied Sciences pertaining to skin /VD & internal medicine and skin**

3. Clinical / Practical and viva voce Examination

Practical examination should be taken to assess competence and skills of techniques and procedures and should consist of two long cases, two short cases and 10 spots.

During oral/viva voce examination, student should be evaluated for Interpretation of data, instruments, clinical problems, radiological and biochemical investigations, slides, drugs, X-rays etc.

Recommended Reading:

Books (latest edition)

- Sexually Transmitted Diseases - Sharma V K
- IADVL Text book of Dermatology - R G Walia
- IAL Textbook of Leprosy - H Kar
- Bolognia “Textbook of Dermatology”
- Text Book of Dermatology, Wilkinson/Ebling/Rook, 4 Volumes, Oxford
- Text Book of Dermatology, Samuel L. Moschelia M.D. Harry J. Hurllay M.D., 2 Volumes
- Histopathology of the Skin, Walter - F. Lever- Gundula Schaumburg Lever
- Atlas of Dermatology, 2 Volumes, Bhalani Publishing House, Dadar, Mumbai.
- Diseases of the skin, I Iarry L Arnold Richard 13-Dom William D. James, Andrews
- Differential Diagnosis in Dermtology, Satish S. Savant, Radha Atalshah, Deepak Gore, Richard Ashan, Barbara Lepdard

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- Leprosy, Dharmendra, 2 Volumes, Samant and Company, Mumbai.
- Recent Advances in Dermatology, Champion, R.H. Pye, R.J. 8th Volumes.
- Venereal Diseases, Amborse King Claude Nicol Philip Rodin, EL.BS English Language Book Society/ Baillere Tindal, East Sussex.
- Sexually Transmitted Diseases, King K Holmes, McGraw-Hill Health profession
- Hand Book of leprosy, Jopling W.H, William Hethgunnah Medical Book Ltd., London.
- Dermatology in General Medicine, Thomas B. Fitzpatrick, McGraw Hill Book Company.
- Fundamentals of Pathology of skin, Mysore Venkataram

Journals

Three international and two national journals (all indexed)

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Annexure I

Postgraduate Students Appraisal Form
Clinical Disciplines

Name of the Department/Unit :

Name of the PG Student :

Period of Training : FROM……TO……

Sr. No.	PARTICULARS	Not Satisfactory	Satisfactory	More Than Satisfactory	Remarks
		1 2 3	4 5 6	7 8 9	
1.	Journal based / recent advances learning				
2.	Patient based /Laboratory or Skill based learning				
3.	Self directed learning and teaching				
4.	Departmental and interdepartmental learning activity				
5.	External and Outreach Activities / CMEs				
6.	Thesis / Research work				
7.	Log Book Maintenance				

Publications **Yes/ No**

Remarks*_____
_____
_____
_____

***REMARKS: Any significant positive or negative attributes of a postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.**

SIGNATURE OF ASSESSEE SIGNATURE OF CONSULTANT SIGNATURE OF HOD

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GUIDELINES FOR COMPETENCY BASED POSTGRADUTE TRAINING PROGRAMME FOR MD IN FORENSIC MEDICINE

Preamble:

The purpose of PG education is to create specialists who would provide high quality health care and advance the cause of science through research & training.

This programme is meant to standardize and strengthen Forensic Medicine teaching at the post graduate level throughout the country so that it will benefit the judiciary and the legal system of the country in providing justice which will ultimately benefit the community at large. It will also help in achieving uniformity in undergraduate teaching.

The purpose of this document is to provide teachers and learners illustrative guidelines to achieve defined outcomes through learning and assessment. This document was prepared by various subject-content specialists. The Reconciliation Board of Academic Committee has attempted to render uniformity without compromise to purpose and content of the document. Compromise in purity of syntax has been made in order to preserve the purpose and content. This has necessitated retention of "domains of learning" under the heading "competencies".

SUBJECT SPECIFIC LEARNING OBJECTIVES

The **Goal** of MD Forensic Medicine is to train a doctor to become a competent medico-legal expert, teacher and researcher in the subject who:

1. is aware of medico legal aspects in various settings
2. *is aware of contemporary advances and developments* in the field of Forensic Medicine.
3. has *acquired the competencies* pertaining to the subject of Forensic Medicine that are required to be practiced at all levels of health system.
4. is oriented to the *principles of research methodology*.
5. has acquired *skills in educating* and imparting training to medical, paramedical and allied professionals.

A post graduate student, upon successfully qualifying in the M.D (Forensic Medicine) examination, should be able to:

1. Become an expert in Forensic Medicine.
2. Identify and define medico-legal problems as they emerge in the community and work to resolve such problems by planning, implementing, evaluating and modulating Medico-legal services.
3. Undertake medico-legal responsibilities and discharge medico-legal duties in required settings.

4. Keep abreast with all recent developments and emerging trends in Forensic Medicine, Medical Ethics and the law.
5. Deal with general principles and practical problems related to forensic, clinical, emergency, environmental, medico-legal and occupational aspects of toxicology.
7. Deal with medico-legal aspects of Psychiatry, mental health and drug addiction.
8. Impart education in Forensic Medicine and Toxicology to under-graduate and post-graduate students with the help of modern teaching aids.
9. Assess the students' knowledge and skills in the subject of Forensic Medicine
10. Oriented to research methodology and conduct of research in the subject

SUBJECT SPECIFIC COMPETENCIES

By the end of the course, the student should have acquired knowledge (cognitive domain), professionalism (affective domain) and skills (psychomotor domain) as given below:

A. Cognitive domain

1. Describe the legal and medico-legal system in India.
2. Acquire knowledge on the philosophy and guiding principles of Forensic Medicine course.
3. Describe the programme goals and objectives of the Forensic Medicine course.
4. Acquire knowledge on conduct of medico-legal autopsy independently with required physical assistance, prepare report and derive inferences.
5. Outline the principles and objectives of postmortem examination.
6. Describe the formalities and procedures of medico-legal autopsies in accordance with existing conventions and the law.
7. Identify the role of anatomy, physiology, biochemistry, microbiology, pathology, blood bank, psychiatry, radiology, forensic science laboratory as well as other disciplines of medical science to logically arrive at a conclusion in medico-legal autopsies and examination of medico-legal cases.
8. Describe the principles of the techniques used in toxicological laboratory namely TLC (Thin Layer Chromatography), GLC (Gas Liquid Chromatography), AAS (Atomic Absorption Spectrophotometry), HPLC (High Performance Liquid Chromatography) and Breath Alcohol Analyzer.
9. Describe relevant legal/court procedures applicable to medico-legal/medical practice.
10. Describe the general forensic principles of ballistics, serology, analytical toxicology and photography.
11. Interpret, analyze and review medico-legal reports prepared by other medical officers at the time of need.
11. Describe role of DNA profile and its application in medico-legal practice.
12. Describe the law/s relating to poisons, drugs, cosmetics, narcotic drugs and psychotropic substances.

13. Describe the legal and ethical aspects of Forensic Procedures including Narco-analysis, Brain mapping and Polygraph etc.
14. Describe the medico-legal aspects of Psychiatry, addiction and mental health.

B. Affective domain

1. Should be able to function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the clinician or other colleagues to provide the best possible opinion.
2. Should be able to follow ethical principles in dealings with patients, police personnel, relatives and other health personnel and to respect their rights.
3. Follow medical etiquettes in dealing with each other.
4. Develop communication skills to word reports and professional opinion as well as to interact with patients, relatives, peers and paramedical staff, and for effective teaching.

C. Psychomotor domain

At the end of the course, the student should acquire following skills and be able to:

1. Perform medico-legal autopsy independently with required physical assistance, prepare report and derive inferences.
2. Perform medico-legal examination of users of alcohol, drugs and poisons and prepare report.
3. Perform medico-legal examination in cases of sexual offences and prepare report.
4. Interpret histo-pathological, microbiological, radiological, chemical analysis, DNA profile and other investigative reports for medico-legal purposes.
5. Perform medico-legal examination of bones, clothing, wet specimens and weapons.
6. Depose as an expert witness in a court of Law on medico-legal matters.
7. Examine, identify, prepare reports and initiate management on medico-legal cases in emergency set up.
8. Identify and discharge all legal responsibilities in medico-legal matters.
9. Plan, organize and supervise medico-legal work in general/teaching/district hospitals and in any health care set up.
10. Collect, preserve and dispatch various samples and trace evidences to the concerned authorities in appropriate manner.
11. Help and Advise authorities on matters related to medical ethics and medico-legal issues.
12. Discharge duties in respect of forensic, clinical, emergency, environmental, medico-legal and occupational aspects of toxicology.
13. Plan, organize and manage toxicological laboratory services in any health care set up.
14. Provide information and consultation on all aspects of toxicology to professionals, industry, Government and the public at large.

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15. Manage medico-legal responsibilities in mass disasters involving multiple deaths like fire, traffic accident, aircraft accident, rail accident and natural calamities.
16. Do interaction with allied departments by rendering services in advanced laboratory investigations and relevant expert opinion.
17. Participate in various workshops/seminars/journal clubs/demonstration in the allied departments, to acquire various skills for collaborative research.

Time frame to acquire knowledge & skills:

First year of PG programme:

1. Orientation Programme
2. Basic autopsy skills.
3. Orientation to the applied aspects of Anatomy, Physiology, Biochemistry
4. General principles of Forensic Medicine.
5. Introduction to Medical Toxicology.
6. Assisting in scheduling of teaching sessions.
7. Participation in undergraduate teaching.
8. Posting for autopsy work, clinical forensic medicine and toxicology.
9. Participation in departmental activities
10. Participation in seminar, CME, workshop etc.
11. Orientation to organization and functioning of toxicology/research laboratory.
12. Preparation of thesis protocol.
13. Being self-updated with recent advances in the subject

Second year of PG programme:

1. Conduct of autopsy examination without supervision in routine autopsy cases
2. Conduct of autopsy examination with supervision in expert opinion cases.
3. Conduct of theory and practical sessions for undergraduates
4. Thesis and other research work
5. Clinical forensic medicine work for practical experience in medico-legal procedures and on-the-job practical training in medico-legal aspects of emergency medicine, radiology and other clinical disciplines.
6. Orientation to the applied aspects of Microbiology, Pathology, Blood Bank, Psychiatry as related to forensic sciences.
7. Posting for autopsy work, clinical forensic medicine and toxicology laboratory.
8. Attend court summons for cases conducted by themselves or where deputed to attend in cases where an expert is required to depose by Court of Law

Third year of PG programme:

1. Organize teaching sessions and thesis work.
2. Submission of thesis six months prior to examination.

3. Posting for autopsy work, clinical forensic medicine and toxicology laboratory to continue.
4. The PG trainee shall be required to conduct minimum of 100 autopsy cases and minimum of 100 clinical cases during the entire training period.
5. Attend Court summons for cases conducted by themselves or when deputed where an expert is required to depose by the Court of Law.
6. The PG trainee shall be required to attend or accompany an expert to attend a minimum of 20 court summons, of which at least 5 should pertain to clinical cases.

Syllabus

Course contents:

I. General Principles of Forensic Medicine and Toxicology

i. Identify the role of anatomy, physiology, biochemistry, microbiology, pathology, blood bank, psychiatry, radiology, forensic science laboratory as well as other disciplines of medical science to logically arrive at a conclusion in medico-legal autopsies and examination of medico-legal cases.

ii. Describe the basic principles of techniques used in toxicological laboratory namely TLC, GLC, ASS, HPLC and Breath Alcohol Analyzer.

iii. Execute the skills and knowledge expected at undergraduate level.

II. Basic Sciences and allied Subjects

A. Anatomy: Anatomy of parts and organs of the body which are important from the medico-legal aspect.

i. Describe surface and regional anatomy of head, neck, chest and abdomen.

ii. Describe gross anatomy and blood supply of heart, brain, lungs, spleen, liver and kidneys.

iii. Describe gross anatomy of male and female genitalia.

iv. Describe the comparative anatomy of male and female skeleton.

v. Perform histological examination of various tissues.

vi. Describe the development of foetus.

B. Physiology and Biochemistry: Mechanism of phenomena that are important in the body from the medico-legal viewpoint.

i. Describe mechanism of fluid and electrolyte balance, thermoregulation in newborn and adults, endocrine functions.

ii. Describe physiology of sexual behavior.

iii. Describe physiological functioning of circulatory system, digestive system, respiratory system, haemopoietic system, central nervous system and reproductive system including pregnancy.

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C. **Pathology:** Pathophysiology of vital processes and response mechanisms that modulate tissue and organ reaction to all forms of injury and have a bearing on antemortem and postmortem appearance in medico-legal cases, assessment of the duration of injuries and correlate trauma and disease.

i. Describe pathology of inflammation and repair, immunity and hypersensitivity, Thrombosis and embolism, electric and ionizing radiation injuries, genetic factors in disease, deficiency disorders and malnutrition.

ii. Describe pathology of myocardial infarction, congenital heart diseases, tuberculosis of lungs, cirrhosis of liver, diseases of glomeruli and tubules and interstitial; tissues of Kidney, tumours, endocrine disorders, venereal diseases, spontaneous intracranial hemorrhages.

iii. Describe the pathology of sudden death.

iv. Describe local and systemic response to trauma and patho-physiology of shock.

v. Describe pathology of common infections and infestations of medico-legal significance.

D. Dentistry: Adequate knowledge of dentistry for solution of medico-legal problems like, injuries, age determination and identification

E. Radiology: Adequate knowledge of radiological procedures for solution of medico-legal problems.

F. Fundamentals of Forensic Medicine:

i. Describe the general forensic principle of ballistics, serology, analytical toxicology and photography.

ii. Interpret the scene of crime.

iii. Describe role of DNA profile and its application in medico-legal practice.

iv. Examine bloodstains for blood grouping, nuclear sexing, HLA typing, seminal stains and hair for medico-legal purpose.

v. Describe ethical aspects of Forensic Procedures including Narco-analysis, Brain mapping and Polygraph

III. Medical Ethics and Law (Medical Jurisprudence)

i. Describe the history of Forensic Medicine.

ii. Describe the legal and medico-legal system in India.

iii. Describe medical ethics and the law in relation to medical practice, declarations, oath, etiquette, Medical Council of India, disciplinary control, rights and duties of a registered medical practitioner's professional misconduct, consent, confidentiality, medical negligence (including all related issues) and Consumer Protection Act.

iv. Describe medical ethics and law in relation to organ transplantation, biomedical human research and experimentation, human rights, cloning, genetic engineering, human genome, citizen's charter and International codes of medical ethics.

v. Describe the ethics and law in relation to artificial insemination, abortion, antenatal sex, foetus, genetics and euthanasia.

vi. Interpret the ethics and law applicable to the human (clinical trials) and animal experimentation.

vii. Describe ethics in relation to elderly, women and children.

viii. Describe medical ethics and law in relation to nursing and other medical services/practices.

ix. Understanding about bio-ethics

IV. Clinical Forensic Medicine

i. Examine, assess legal implications and prepare report or certificate in cases of physical assault, suspected drunkenness, sexual offences, consummation of marriage and disputed paternity.

ii. Collect, preserve and dispatch the specimen/material to the concerned authority and interpret the clinical and laboratory findings which are reported.

iii. Examine injured person, prepare medico-legal report and initiate management.

iv. Determine the age and establish identity of an individual for medico-legal purpose.

v. Examine a person and assess disability in industrial accidents and diseases.

vi. Perform examination and interpret findings for medico-legal purposes in cases pertaining to pregnancy, delivery, artificial insemination, abortion, sterilization, Impotence, AIDS and infectious disease.

vii. Describe normal and abnormal sexual behavior and its medico-legal implications.

viii. Examine and assess the medical fitness of a person for insurance, government service, sickness and fitness on recovery from illness.

ix. Examine medico-legal problems related to clinical disciplines of medicine and allied subjects, Pediatrics, Surgery and allied subjects, ENT, Ophthalmology, Obstetrics and Gynecology, Dermatology and Anesthesiology.

x. Examine medico-legal problems related to children, women and elderly.

xi. Identify the cases of torture and violation of human rights and issues thereto

V. Forensic Pathology

i. Apply the principles involved in methods of identification of human remains by race, age, sex, religion, complexion, stature, hair, teeth, anthropometry, dactylography, foot prints, hairs, tattoos, poroscopy and superimposition techniques.

ii. Perform medico-legal postmortem and be able to exhume, collect, preserve and dispatch specimens or trace evidence to the appropriate authority.

iii. Diagnose and describe the pathology of wounds, mechanical and regional injuries, ballistics and wound ballistics, electrical injuries, lightening, neglect and starvation, thermal injuries, deaths associated with sexual offences, pregnancy, delivery, abortion, child abuse, dysbarism and barotraumas.

iv. Describe patho-physiology of shock and neurogenic shock.

v. Describe patho-physiology of asphyxia, classification, medico-legal aspects and postmortem findings of different types of asphyxial deaths.

vi. Diagnose and classify death, identify the signs of death, postmortem changes, interpret autopsy findings, artifacts and results of the other relevant investigations to logically conclude the cause, manner (suicidal, homicidal and accidental) and time of death.

vii. Manage medico-legal responsibilities in mass disasters involving multiple deaths like fire, traffic accident, aircraft accident, rail accident and natural calamities.

viii. Demonstrate postmortem findings in infant death and to differentiate amongst live birth, still birth and dead born.

ix. Perform postmortem examination in cases of death in custody, torture and violation of human rights.

x. Perform postmortem examination in cases of death due to alleged medical negligence as in operative and anesthetic deaths.

VI. Toxicology

i. Describe the law relating to poisons, drugs, cosmetics, narcotic drugs and
   a. psychotropic substances.

ii. Examine and diagnose poisoning cases and apply principles of general management and organ system approach for the management of poisoning cases.

iii. Describe the basic principles of pharmacokinetics and pharmacodynamics of poisonous substances.

iv. Describe the toxic hazards of occupation, industry, environment and the principles of predictive toxicology.

v. Collect, preserve and dispatch material/s for analysis, interpret the laboratory findings and perform the Medico-legal formalities in a case of poisoning.

vi. Demonstrate the methods of identification and analysis of common poisons

vii. Describe the signs, symptoms, diagnosis and management of common acute and chronic poisoning due to:
   a. Corrosives
   b. Nonmetallic substances
   c. Insecticides and weed killers
   d. Metallic substances
   e. Vegetable and organic irritants
   f. Somniferous compounds
   g. Inebriant substances
   h. Deliriant substances
   i. Food Contamination/adulteration.
   j. Substances causing spinal and cardiac toxicity
   k. Substances causing asphyxia (Asphyxiants)
   l. Household toxins
   m. Toxic envenomation

n. Biological and chemical warfare
o. Environmental intoxicants
P. Occupational intoxicants

VII. Forensic Psychiatry

i. Explain the common terminologies of forensic importance in Psychiatry.
ii. Describe the medico-legal aspects of Psychiatry and mental health.
iii. Describe medico-legal aspects of drug addiction.
iv. Describe role of Psychiatry in criminal investigation, punishment and trial.
v. Describe the civil and criminal responsibilities of a mentally ill person.
vi. Describe the role of Psychology in criminal investigation, punishment and trial

TEACHING AND LEARNING METHODS

Teaching methodology

1. L**ectures:** Lectures are to be kept to a minimum. They may, however, be employed for teaching certain topics. Lectures may be didactic or integrated.

   The course shall be of three years, organized in six units (0-5). This modular pattern is a guideline for the department, to organize training. Training programme can be modified depending upon the work load and academic assignments of the department.
2. **Journal Club & Subject seminars:**
   Both are recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the Log Book relevant details. Further, every PG trainee must make a presentation from the allotted journal(s), selected articles and a total of 12 seminar presentations in three years. The presentations would be evaluated and would carry weightage for internal assessment.
3. **Case Presentations:** Minimum of 5 cases to be presented by every PG trainee each year. They should be assessed using check lists and entries made in the log book
4. **Clinico-Pathological correlation \ Conference:** Recommended once a month for all post graduate students. Presentation is to be done by rotation. If cases are not available, it could be supplemented by published CPCs.
5. **Inter-Departmental Meetings:** These meetings should be attended by post graduate students and relevant entries must be made in the Log Book.
6. **Teaching Skills:** The postgraduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.
7. Undertake audit, use information technology tools and carry out research, both basic and clinical, with the aim of publishing his work and presenting his work at various scientific fora.

8. **Continuing Medical Education Programmes (CME):** At least two CME programmes should be attended by each student in 3 years.

9. **Conferences:** The student to attend courses, conferences and seminars relevant to the speciality.

10. A postgraduate student of a postgraduate degree course in broad specialities/super specialities would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.

11. **Rotation:**

Other than the Department of Forensic Medicine, student may be posted for training in the following clinical disciplines for a given period of time on rotational basis:

	Place of posting	First year	Second year	Third year
01	Trauma & Emergency/ Casualty / Emergency medicine department	1 month	15 days	15 day
02	Radiology	7 days	5 days	3 days
03	Psychiatry	5 days	3 days	2 days
04	Forensic science lab	7 days	15 days	Not required
05	Histopathology	7 days	5 days	3 days

12. Department should encourage e-learning activities.

ASSESSMENT

FORMATIVE ASSESSMENT, ie., during the training

General Principles

Internal Assessment should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills. The Internal Assessment should be conducted in theory and clinical examination.

Quarterly assessment during the MD training should be based on following educational activities:

1. **Journal based / recent advances learning**
2. **Patient based /Laboratory or Skill based learning**
3. **Self directed learning and teaching**
4. **Departmental and interdepartmental learning activity**

5. External and Outreach Activities / CMEs

The student to be assessed periodically as per categories listed in postgraduate student appraisal form (Annexure I).

SUMMATIVE ASSESSMENT, ie., assessment at the end of training

The Postgraduate examination shall be in three parts:

The summative examination would be carried out as per the Rules given in POSTGRADUATE MEDICAL EDUCATION REGULATIONS, 2000.

The examination shall be in three parts:

1. Thesis

Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination. The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and practical examination. A PG trainee shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners.

2. Theory:

The examinations shall be organized on the basis of 'Grading'or 'Marking system' to evaluate and to certify PG trainee's level of knowledge, skill and competence at the end of the training. Obtaining a minimum of 50% marks in 'Theory' as well as 'Practical' separately shall be mandatory for passing examination as a whole. The examination for M.D. shall be held at the end of 3rd academic year. An academic term shall mean six month's training period.

There shall be four papers each of three hours duration. These are:

2. **Theory Examination**: There shall be four theory papers.

Paper 1: Basic of Forensic Medicine, basic sciences and allied subjects.

Paper II: Clinical Forensic Medicine and medical jurisprudence.

Paper III: Forensic pathology and toxicology.

Paper IV: recent advances in Forensic Medicine, Forensic Psychiatry and Medical Toxicology, applied aspects of clinical disciplines and forensic sciences

3. **Practical Examination:**

Practical examination would be spread over two days and should be as follows:

Day 1

- **Clinical Cases** - (any 4) Age estimation, injury report, examination of an insane person to evaluate criminal/civil responsibility, examination of an intoxicated person, examination of a suspected case of poisoning (acute/chronic), disputed paternity case and sexual offences (accused and victim).

- Spots - (10) Histopathology slides, photographs, exhibit material, X-rays, mounted specimens, bones, poisons and weapons, charts etc.
- Toxicology Exercises - (02) Identification and details of common poisons or chemical tests etc.
- Laboratory Tests - (01) Identification of biological stains (Semen, Blood, Body fluids), Histopathology slides of medico legal relevance, gram and acid fast staining etc.

Day 2

- Postmortem Examination.
- Thesis/Seminar Presentation - For assessment of research/teaching ability
- Discussion on a case for expert opinion
- Grand Viva Voce.

Recommended Reading

Books (latest edition)

1. Subramanyam BV. Modi's Medical Jurisprudence and Toxicology. Butterworths India, New Delhi.
2. Nundy A. Principles of Forensic Medicine, New Central Book Agency Calcutta.
3. Lyon's Medical Jurisprudence for India. Delhi Law House, Delhi.
4. Reddy KSN. The Essentials of Forensic Medicine and Toxicology, K. Saguna Devi Publishers, Hyderabad.
5. Parikh CK. Parikh's Textbook of Medical Jurisprudence, Forensic Medicine and Toxicology, CBS Publishers and Distributors, New Delhi.
6. Bernard Knight. Forensic Pathology. Arnold Publishers London.
7. + Di Maio VJ, Di Maio D. Forensic Pathology. CRC Press New York.
8. Camps FE. Gradwohl's legal Medicine. Bristol: John Wright and Sons Ltd.
9. American College of Legal Medicine Textbook Committee. Legal Medicine Mosby Publishers, USA.
10. Di Maio VJM. Gunshot Wounds, CRC Press USA.
11. Gordon I, Shapiro HA, Berson SD. Forensic Medicine – A Guide to Principle. Churchill Livingstone New York.
12. Mant AK. Taylor's Principles and Practice of Medical Jurisprudence, Churchill Livingstone, New York.
13. Parikh CK. Medicolegal Postmortems in India. Medical Publications, Bombay.
14. Gresham GA, Turner AF. Postmortem Procedurs An illustrated Text Book. Wolfe Medical Publications.
15. Ludwing J. Current Methods of Autopsy Practice. WB Saunders Company, London.
16. Gordon I, Turner R. Medical Jurisprudence E and S Livingstone Ltd. London.

17. Spitz WU, Fisher RS. Medico-legal Investigation of Death. Charles Thomas Publishers.
18. Schroeder O.C. Dental Jurisprudence. PSG Publishing Company, Littleton, Massachussetts.
19. Stark MM. A Physicians Guide to Clinical Forensic Medicine. Humana Press Totowa, New Jersey.
20. Olshakar JS, Jackson JS. Jackson MC, Smock WS. Forensic Emergency Medicine. Lippincott William and Wilkins, Philadelphia.
21. Norah Rudin, Keith Inman. An introduction to Forensic DNA Analysis. CRC Press, London.
22. Robertson J, Ross AM, Burgoyne LA. DNA in Forensic Science - Theory, Technique and Application. Ellis Horwood, UK
23. Curry AS. Method of Forensic Science Vol. I-III. Inter-science Publishers London.
24. Clement JG, Ranson DL. Craniofacial Identification in Forensic Medicine. Arnold Publishers, London.
25. Sellier GK, Kneubuechl BP. Wound Ballistics and the scientific background. Elsevier, Amsterdam.
26. Bernard Knight. Simpson's Forensic Medicine. Arnold Publishers London.
27. Bernard Knight. Legal aspects of Medical Practice. Churchill Livingstone New York.
28. Gunn and Taylor. Forensic Psychiatry Clinical, Legal and Ethical issues. Butterworth Heinemann
29. G Gustafson. Forensic Odontology. Staples Press.
30. Gonzalez TA. Legal Medicine, Pathology and Toxicology- Appleton Century-Crofts Inc. New York.
31. Hirsch CS, Morris RC, Moritz AR. Handbbok of Legal Medicine. CV Mosby Company London.
32. Lincoln PJ, Thomas J. Forensic DNA Profiling Protocols. Methods in Molecular Biology, Vol. 98, Humana Press, Totowa, New Jersey.
33. Lee HC, Gaensslen RE. DNA and other polymorphism in Forensic Science. Yearbook Medical Publishers, London.
34. Bergaus G, Brinkmann B, Rittner C. Staak M. (Eds.). DNA Technology and its Forensic Application. Springer- Verlag. Berlin
35. Beveridge A. Forensic Investigation of Explosions. Taylor and Francis USA.
36. Jay Dix. Colour Atlas of Forensic Pathology. CRC Press New York.
37. Bernard Knight. (ed.) The Estimation of Time since Death in the early Post Mortem Period. Arnold Publishers London.
38. Mant AK. Modern Trends in Forensic Medicine 1-3. Butterworth, London.
39. Luntz and Luntz. Handbook for Dental Identification. JB Lippincott. Toronto.
40. Buttler JM. Forensic DNA Typing. Academic Press New York.
41. Mason JK. Forensic Medicine- an illustrated reference. Chapmann and Hall, London.

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42. Mason JK. Paediatric Forensic Medicine and Pathology. Chapmann and Hall, London.
43. Patnaik VP. MKR Krishnan's handbook of Forensic Medicine. Paras Publishing.
44. Lundquist Frank. Methods of Forensic science, vol. II, Interscience publishers.
45. Mehta HS. Medical, Law and Ethics in India. The Bombay Samachar Pvt. Ltd.
46. Gaur's firearms, Forensic Ballistics, Forensic Chemistry and Criminal Jurisprudence. Law Publishers (India) Pvt. Ltd. Allahabad.
47. Tedeschi Eckert. Forensic Medicine Vol. I -IV, WB Saunders Company.
48. Polson, Gee, Knight. The Essentials of Forensic Medicine. Pergomann Press, UK.
49. Redsicker DR. Forensic Photography, CRC Press USA.
50. Krogmann. Human skeleton in Forensic Medicine.
51. Abdullah Fateh. Handbook of Forensic Pathology
52. Simpson K. Taylor's Principle and Practice of Medical Jurisprudence. Vol. I-II.
53. Krishan Vij. Textbook of Forensic Medicine and Toxicology, Churchill Livingstone.
54. Pillay VV. Textbook of Forensic Medicine and Toxicology, Paras Publishing, Hyderabad.
55. Mukherjee JB. Textbook of Forensic Medicine and Toxicology, Arnold's Publishers, London.
56. Henry J, Wiseman H. Management of Poisoning. Published by WHO, UNEP and ILO.
57. Flanagan RJ et al. Basic Analytical Toxicology. Published by WHO, UNEP and ILO.
58. Guidelines for Poison Control. Published by WHO, UNEP and ILO
59. Genetics in Medicine – J. S. Thompson and M.W. Thompson.
60. Research – How to plan, speak and write about it – C. Hawkins and M. Sorgi.

Journals

03-05 international Journals and 02 national (all indexed) journals

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Annexure 1

Postgraduate Students Appraisal Form

Pre / Para /Clinical Disciplines

Name of the Department/Unit :

Name of the PG Student :

Period of Training : FROM……TO……

Sr. No.	PARTICULARS	Not Satisfactory	Satisfactory	More Than Satisfactory	Remarks
		1 2 3	4 5 6	7 8 9	
1.	Journal based / recent advances learning				
2.	Patient based /Laboratory or Skill based learning				
3.	Self directed learning and teaching				
4.	Departmental and interdepartmental learning activity				
5.	External and Outreach Activities / CMEs				
6.	Thesis / Research work				
7.	Log Book Maintenance				

Publications Yes/ No

Remarks* _____

_____

_____

_____

***REMARKS: Any significant positive or negative attributes of a postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.**

SIGNATURE OF ASSESSEE SIGNATURE OF CONSULTANT SIGNATURE OF HOD

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NATIONAL MEDICAL COMMISSION
Postgraduate Medical Education Board

D 11011/1/22/AC/Guidelines/09 **Date: 01-08-22**

National Medical Commission

GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR M.D. IN GENERAL MEDICINE

GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR MD IN GENERAL MEDICINE

Preamble:

The purpose of post graduate (PG) education in General Medicine is to create specialists who would provide appropriate health care to the community and advance the cause of science through research, training and teaching the medical fraternity.

The competency-based training programme aims to produce a postgraduate doctor who after required training should be able to deal effectively with the medical needs of the community. The postgraduate specialist is also expected to know the principles of research methodology and be able to update himself with advances and practice evidence-based medicine. They should be trained to work in synchrony with faculty in super-speciality courses of Medicine and to follow a holistic approach to medical care which would lead to the development of good quality teachers. This document has been prepared by subject-content specialists of the National Medical Commission. The Expert Group of the National Medical Commission had attempted to render uniformity without compromise to the purpose and content of the document. Compromise in purity of syntax has been made in order to preserve the purpose and content. This has necessitated retention of "domains of learning" under the heading "competencies.

National Medical Commission

SUBJECT SPECIFIC OBJECTIVES

Postgraduate training should enable the student to:

- Practice internal medicine with competence, with the help of scientific knowledge in an evidence based fashion.
- Conduct clinical examination and relevant investigations, diagnose medical conditions and refer early where indicated.
- Plan and deliver comprehensive treatment using the principles of rational drug therapy.
- Plan and advise measures for the prevention and rehabilitation of patients.

- Manage emergencies efficiently by providing Basic Life Support (BLS) and Advanced Life Support (ALS).
- Recognize conditions that may be outside of scope of general medicine and refer to an appropriate specialist.
- Exercise empathy and a caring attitude and maintain professional integrity, honesty and high ethical standards.
- Document case details including epidemiological data.
- Play the assigned role in the implementation of National Health Programs.
- Demonstrate competence in basic concepts of research methodology and clinical epidemiology; and preventive aspects of various disease states.
- Become a motivated 'teacher' - defined as one keen to share knowledge and skills with a colleague or a junior or any learner.
- Continue to evince keen interest in continuing education and use appropriate learning resources.
- Practice the medico-legal responsibilities.
- Undertake audit related to patient care, morbidity and mortality, use information technology tools and carry out research - both basic and clinical, with the aim of publishing the work and presenting the work at scientific forums.
- Participate in public health emergencies (arising in the community).
- Estimate the financial burden of care and practice health economics and rational approach to investigations.
- Communicate about the illness with patient's/relatives at all stages of care.

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SUBJECT SPECIFIC COMPETENCIES

By the end of the course, the student should have acquired knowledge (cognitive domain), professionalism (affective domain) and skills (psychomotor domain) as given below:

A. Predominant in Cognitive Domain:

1. Describe clinical features of diseases of various aetiology affecting all systems in the adult and geriatric population.

2. Apply the basic sciences knowledge in understanding and managing common diseases.
3. Describe the investigations to be undertaken at various levels like OPD, Ward, ICU etc. and choose them appropriately depending on the clinical features and epidemiologic principles.
4. Describe the pharmaco-therapeutics of various diseases and complications.
5. Describe and discuss the health issues related to environmental and ecological factors.
6. Describe and discuss the methods and mechanisms of rehabilitation following diseases.
7. Describe and discuss the issues related to palliative and terminal care.
8. Incorporate the national and international guidelines related to various diseases in day to day practice and teaching.
9. Describe and discuss the social and economic aspects of illnesses, outbreaks and epidemics.
10. Analyse the observations of disease patterns in patients and community and make suggestions for improvement in management and prevention.
11. Describe and discuss the National Health Programs.
12. Analyse and critique the publications related to various aspects of illnesses and evidence based medicine.
13. Describe and discuss the various levels of prevention in communicable and non - communicable diseases.
14. Describe and discuss various legislations related to organ transplant, brain death, informed consent, human rights etc.
15. Be updated on recent advances in internal medicine.

B. Affective Domain:

1. Should be able to function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the patient, relatives, paramedical and medical colleagues to provide the best possible comprehensive care.

2. Always adopt ethical principles and maintain professional etiquette in dealing with patients, relatives and other health personnel and to respect the rights of the patient including the right to information and second opinion.

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3. Develop communication skills to interact with patients, relatives, peers and paramedical staff, with special emphasis on breaking bad news empathetically.

4. Should demonstrate equity and equality when dealing with individuals of special groups (differently abled and LGBTQIA+).

C. Predominant in Psychomotor domain:

The post graduate student, at the end of the course should be able to perform the following skills, independently (PI) or under supervision (PS):

Clinical Assessment Skills

- Elicit a detailed clinical history (PI)
- Perform a thorough physical examination of all the systems (PI)

Procedural skills

- Pleural tap (PI)
- Lumbar puncture (PI)
- Arterial puncture for ABG (PI)
- Bone marrow aspiration and biopsy (PI)
- Abdominal paracentesis - diagnostic (PI)
- Aspiration of liver abscess (PI)

DESIRABLE

- Ultrasound abdomen at point of care (PI)
- Fine needle aspiration cytology (FNAC) from palpable lumps (PI)
- Pericardiocentesis (PS)
- Joint fluid aspiration (PI)
- Liver biopsy (PI)
- Kidney biopsy (PS)
- Cardiac-TMT (PS)
    - Holter monitoring (PS)
    - Echocardiography (point of care) (PS)
    - Doppler studies (PS)

Respiratory management

- Non-invasive and mechanical ventilation (PI)

Critically ill person

- Monitoring a sick person (PI)

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- Endotracheal intubation (PI)
- Cardio-pulmonary resuscitation(PI)
- Central vein cannulation and CVP monitoring (PI)
- Using a defibrillator (PI)
- Hemodialysis (PS)
- Certification of Brain death (PI)

Interpretation Skills

Interpretation of results of the following investigations, considering clinical data (history & examination findings).

- Treadmill testing (PI)
- ABG analysis (PI)
- Ultrasonography (PI)
- CT scan chest and abdomen (PI)
- CT scan head and spine (PI)
- MRI- Brain and spine (PI)
- Barium studies- desirable (PI)
- Pulmonary function tests (PI)
- Immunological investigations (PI)
- Nerve Conduction studies /EMG (PI)
- EEG (PI)
- Evoked Potential interpretation (PI)

Communication skills (PI)

While eliciting clinical history and performing physical examination, emphasize on:

- Communicating health and disease,
- Pre-test and post-test counseling for HIV,
- Pedagogy: teaching students, other health functionaries: lectures, bedside clinics, discussions,
- Health education: prevention of common medical problems, promoting healthy life-style, immunization, periodic health screening, counseling skills in risk factors for

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common malignancies, cardiovascular disease, AIDS etc.

- Dietary counseling in health and disease,
- Linking patients with community resources,
- Providing referral,
- Genetic counseling,
- Communicating bad news to the patient and relatives.

Others

- ***Demonstration of the following:*** **(PI)**
  - professionalism
  - ethical behavior (humane and professional care to patients)
- ***Utilization of information technology***
  - Medline search, Internet access, computer usage
- ***Research methodology***
  - designing a study
  - interpretation and presentation of scientific data
- ***Self-directed learning***
  - identifying key information sources
  - literature searches
  - information management
- ***Therapeutic decision-making***
  - managing multiple problems simultaneously
  - assessing risks, benefits and costs of treatment options
  - involving patients in decision-making
  - selecting specific drugs within classes
  - rational use of drugs

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Syllabus

Course contents:

A: Cognitive domain:

Basic Sciences

1. Basics of human anatomy as relevant to clinical practice:

- Surface anatomy of various viscera

- Neuro-anatomy
- Important structures/organ's location in different anatomical locations in the body
- Histology of organs
- Blood supply, nerve supply to various organs

2. Applied physiology of various organ systems:
    - Basic functioning of various organ-system, control of vital functions.
    - pathophysiological alteration in diseased states.
    - interpretation of symptoms and signs in relation to pathophysiology.
    - Physiology of temperature, sleep regulation.

3. Applied biochemical basis of various diseases including fluid and electrolyte disorders:
    - Acid - base disorders, disorders of carbohydrate, fat, protein, calcium, phosphorous and iron metabolism.
    - Interpretation and clinical application of various biochemical tests.

4. Applied pathology of different diseases.
    - Common pathological changes in various organs associated with diseases and their correlation with clinical signs.
    - Understanding of various pathogenic processes and possible therapeutic interventions, and
    - Preventive measures at various levels to reverse or arrest the progression of diseases.

5. Knowledge about various microorganisms, their special characteristics important for their pathogenetic potential or of diagnostic help:
    - Important organisms associated with tropical diseases, their growth pattern/life-cycles,
    - Levels of therapeutic interventions possible in preventing and/or eradicating the organisms,
    - Antimicrobial resistance,
    - Antibiotic stewardship,
    - Hospital infection control,
    - Biomedical waste management,
    - Vaccinology.

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6. Knowledge about pharmacokinetics and pharmaco-dynamics of the drugs used for the management of common problems in a normal person and in patients with diseases of kidneys/liver/systemic disorders which may need alteration in doses due to abnormal metabolism/excretion of the drugs:

    - pharmacokinetics and pharmaco-dynamics of drugs: principles and methodology
    - Rational use of available drugs.
    - Principles of drug therapy,
    - Adverse drug reactions,
    - Drug interaction,
    - Pharmacovigilance,
    - Drug abuse and addiction,
    - Drug development,
    - Pharmacoeconomics,
    - Pharmacogenomics.

7. Research methodology, study designs, clinical epidemiology and biostatistics relevant to medical sciences.

8. National Health Programmes:

    - investigation of community outbreak,
    - public health policy,
    - health promotion,
    - prevention of communicable and non-communicable diseases.
    - International health regulations,
    - Travel medicine.

9. Knowledge about various poisons with specific reference to different geographical and clinical settings - their diagnosis and management.

    - Knowledge about snake bite, other bites and stings,
    - medicolegal aspects.

Systemic Medicine

10. Preventive and environmental issues, including principles of preventive health care, immunization and occupational, environmental medicine and bioterrorism,

    - Health tourism,

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- Rehabilitation,
- Drowning,
- Heat and altitude related disorders.

11. Geriatric Medicine:

- Physiology and biology of aging and various organ changes in elderly.
- Principles of geriatric medicine and uniqueness of geriatric presentation.
- Physical examination of geriatric patient.
- drug metabolism, laboratory tests in elderly.
- Management of unique problems related to elderly such as nutrition, falls, gait disorders, neuro- psychiatric problems etc.
- Mental health disorders,
- Elderly neglect and abuse,
- Social and family support and rehabilitation of elderly.
- Assessment of functional and cognitive aspects, counseling and communication with elderly.
- Appropriate medication and avoidance of poly-pharmacy.

12. Genetics:

- Overview of the paradigm of genetic contribution to health and disease
- Principles of Human Genetics
- Genetic basis of medical disorders
- Single gene and chromosomal disorders
- Genetic counseling
- Prevention of genetic disorders
- Genetic analysis
- Gene therapy

13. Immunology:

- Innate and adaptive immune systems
- Mechanisms of immune mediated cell injury
- HLA system, primary and secondary immune-deficiency,
- Allergic disorders: urticaria, angioedema, anaphylaxis and other allergic disorders.
- Transplantation immunology, immunocomplex disorders, organ specific and multisystem immune disorders, monoclonal antibodies.

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14. Cardio-vascular diseases:

- Approach to the patient with possible cardio-vascular diseases
- Investigative cardiology
- Heart failure
- Arrhythmias
- Hypertension
- Coronary artery disease
- Valvular heart disease
- Infective endocarditis
- Diseases of the myocardium and pericardium
- Diseases of the aorta and peripheral vascular system
- Congenital heart diseases
- Pulmonary arterial hypertension
- Cor pulmonale

15. Respiratory system:

- Approach to the patient with respiratory diseases
- Investigative pulmonology
- Disorders of ventilation
- Asthma
- Chronic Obstructive Pulmonary Disease (COPD)
- Bronchiectasis
- Occupational lung diseases
- Interstitial lung diseases
- Hypersensitivity Pneumonitis
- Pneumonia and suppurative lung diseases
- Pulmonary embolism
- Cystic fibrosis
- Obstructive sleep apnoea syndrome and diseases of the chest wall, pleura and mediastinum
- Pulmonary manifestations of systemic diseases

16. Nephrology:

- Approach to the patient with renal diseases
- Acute kidney injury

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- Chronic kidney disease
- Glomerular diseases
- Nephrotic syndrome
- Reno vascular hypertension
- Cystic Diseases of the kidney
- Tubulo-interstitial diseases
- Nephrolithiasis
- Urinary tract infection and pyelonephritis
- Diabetes and the kidney
- Obstructive uropathy and treatment of irreversible renal failure
- Dialysis
- Renal involvement in systemic diseases

17. Gastro-intestinal diseases:

- Approach to the patient with gastrointestinal diseases
- Gastrointestinal endoscopy
- Motility disorders
- Diseases of the esophagus
- Acid peptic disease
- Functional gastrointestinal disorders
- Diarrhea
- Malabsorption syndromes
- Irritable bowel syndrome
- Inflammatory bowel diseases
- Mesenteric vascular insufficiency
- Diverticular disease
- Acute intestinal obstruction
- Peritonitis
- Diseases of the rectum and anus

18. Diseases of the liver and gall bladder:

- Approach to the patient with liver disease
- Interpretation of liver function tests
- Hyperbilirubinemia
- Acute viral hepatitis
- Drug induced /toxic hepatitis

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- Chronic hepatitis
- Alcoholic and non-alcoholic steatohepatitis
- Cirrhosis and its sequelae/ complications
- Portal hypertension
- Budd Chiari syndrome
- Hepatic failure and liver transplantation
- Diseases of the gall bladder and bile ducts
- Disease of pancreas including pancreatitis

19. Haematologic diseases:

- Hematopoiesis
- Anemias
- Leucopenia and leukocytosis
- Myelo-proliferative disorders
- Bone marrow failure syndromes
- Plasma cell disorders
- Disorders of hemostasis and haemopoietic stem cell transplantation
- Platelet Disorders
- Hypercoagulable conditions
- Blood components and transfusion medicine

20. Oncology:

- Epidemiology
- Biology and genetics of cancer
- Approach to patient with cancer
- Early detection or prevention of cancer
- Infection in cancer patients
- Oncological emergencies
- Paraneoplastic syndromes and endocrine manifestations of tumours
- Metastatic cancer of unknown primary site
- Hematological malignancies
- Cancers of various organ systems and cancer chemotherapy
- Rehabilitation and palliative care in cancer patients.

21. Metabolic diseases - inborn errors of metabolism and disorders of metabolism:

- Hemochromatosis

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- Wilson's disease
- Porphyrias
- Other inborn errors of metabolism.

22. Nutritional diseases:

- Nutritional assessment, Anthropometry
- Enteral and parenteral nutrition
- Obesity and eating disorders.
- Malnutrition
- Vitamin and trace element deficiencies and excess.

23. Endocrine diseases:

- Approach to patients with endocrine disorders
- Disorders of Pituitary
- Disorders of thyroid gland
- Disorders of adrenal cortex
- Pheochromocytoma
- Multiple endocrine neoplasia
- Autoimmune polyendocrine syndromes
- Reproductive endocrinology including menopause and postmenopausal hormone therapy
- Diabetes mellitus
- Hypoglycemia
- Metabolic Syndrome
- Dyslipidemia
- Disorders of parathyroid gland
- Disorders of bone and mineral metabolism in health and disease
- Osteoporosis

24. Rheumatic diseases:

- Approach to the patient with rheumatic diseases
- Osteoarthritis
- Rheumatoid arthritis
- Spondyloarthropathies
- Systemic lupus erythematosus (SLE)
- Sarcoidosis

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- Sjogren's syndrome
- Systemic sclerosis
- Anti-phospholipid antibody syndrome
- Bechet's disease
- Vasculitis syndromes
- Acute rheumatic fever
- Inflammatory myopathies
- Arthritis associated with systemic diseases
- Gout and crystal associated arthritis
- Relapsing polychondritis
- IgG4 related disease
- Polymyalgia rheumatica
- Fibromyalgia
- Amyloidosis

25. Infectious diseases:

- Basic consideration in Infectious Diseases
- Clinical syndromes
- Community acquired clinical syndromes
- Nosocomial infections
- Infections in immunocompromised
- Bacterial diseases - General consideration, diseases caused by gram - positive bacteria, diseases caused by gram - negative bacteria, miscellaneous bacterial infections, Atypical bacterial infections - Mycobacterial diseases, Spirochetal diseases, Rickettsial disease, Mycoplasma and Chlamydia.
- Viral diseases - DNA viruses, RNA viruses, HIV infection, Emerging viral diseases - Coronavirus, Nipha virus, H1N1 virus, Hantavirus.
- Fungal infections,
- Protozoal infections,
- Helminthic infections.

26. Neurology

- Approach to the patient with neurologic diseases,
- Diagnostic neurology,
- Localization of neurological disease/s,

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- Headache,
- Seizure disorders and epilepsy,
- Coma,
- Disorders of sleep,
- Cerebrovascular diseases,
- Cranial neuropathy,
- Dementias and neurodegenerative diseases,
- Brain abscess,
- Demyelinating diseases,
- Parkinson's disease and other movement disorders,
- Motor neuron diseases,
- Ataxic and gait disorders,
- Meningitis and encephalitis,
- Prion diseases,
- Peripheral neuropathies,
- Muscle diseases,
- Diseases of spinal cord
- Diseases of neuromuscular transmission,
- Autonomic disorders and their management.

27. Psychiatric disorders

Common psychiatric disorders in adult & geriatric population:

- Mood (affective) disorders,
- Anxiety disorders,
- Schizophrenia,
- Organic mental disorders,
- Eating disorders,
- Sexual disorders,
- Personality disorder and suicide and self-harm,
- Autistic disorders,
- Functional and psychosomatic disorder,
- Somatoform disorder,
- Dissociative/ conversion disorder.
- Substance use disorders.

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28. Dermatology:

- Structure and functions of skin.
- Infections of skin.
- Papulo-squamous and inflammatory skin rashes.
- Photo-dermatology.
- Erythroderma.
- Cutaneous manifestations of systematic diseases.
- Bullous diseases.
- Drug induced rashes.
- Disorders of hair and nails.
- Principles of topical therapy.

29. Critical care medicine

- Approach to patient with critical illness.
- Acute respiratory distress syndrome.
- Mechanical ventilatory support.
- Approach to patient with shock.
- Sepsis and septic shock.
- Cardiogenic shock and pulmonary edema.
- Cardiovascular collapse and cardiac arrest.
- Cardiopulmonary resuscitation.

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30. Miscellaneous

- Medical illnesses in pregnancy
- Peri-operative evaluations

B: Psychomotor domain: Detailed guidelines on this section are given under Subject specific competencies.

TEACHING AND LEARNING METHODS

General principles

Acquisition of competencies being the keystone of doctoral medical education, such training should be skills oriented. Learning in the program, essentially autonomous and self-directed,

and emanating from academic and clinical work, shall also include assisted learning. The formal sessions are meant to supplement this core effort.

All students joining the postgraduate (PG) courses shall work as full-time (junior) residents during the period of training, attending not less than 80% of the training activity during the calendar year, and participating in all assignments and facets of the educational process. They shall maintain a log book for recording the training they have undergone, and details of the procedures done during laboratory and clinical postings in real time.

Teaching-Learning methods

This should include a judicious mix of demonstrations, symposia, journal clubs, clinical meetings, seminars, small group discussion, bed-side teaching, case-based learning, simulation-based teaching, self-directed learning, integrated learning, interdepartmental meetings and any other collaborative activity with the allied departments. Methods with exposure to the applied aspects of the subject relevant to basic/clinical sciences should also be used. **The suggested examples of teaching-learning methods are given below but are not limited to these. The frequency of various below mentioned teaching-learning methods can vary based on the subject's requirements, competencies, work load and overall working schedule in the concerned subject.**

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Self Directed Learning (SDL) is an extension of the role of lifelong learner envisaged in the goals of the Indian Medical Graduate. All postgraduate students are expected to learn through Problem Based Learning, SDL, Project Based learning etc. Various forms of self-learning including those mediated through IT - enhanced methodologies must be adopted. Specific hours need not be ear-marked, but these should be integrated into day to day practice.

Post graduates in all specialities are expected to learn through work-based discussions and experiential learning. Beyond documentations in logbook, they should demonstrate competency related to patient care, interpretation and communication skills during the routine work in wards, OPD, ICUs, district residency postings etc. They should be involved in teaching of Undergraduate (MBBS) students also.

A. Lectures: Didactic lectures should be used sparingly. A minimum of 10 lectures per year in the concerned PG department is suggested. Topics are to be selected as per subject

requirements. All postgraduate trainees will be required to attend these lectures. Lectures can cover topics such as:

1. Subject related important topics as per specialty requirement
2. Recent advances
3. Research methodology and biostatistics
4. **Salient features of** Undergraduate/Postgraduate medical curriculum
5. Teaching and assessment methodology.

Topic numbers 3, 4, 5 can be done during research methodology/biostatistics and medical education workshops in the institute.

B. Journal club: Minimum of once in 1-2 weeks is suggested.

Topics will include presentation and critical appraisal of original research papers published in peer reviewed indexed journals. The presenter(s) shall be assessed by faculty and grades recorded in the logbook.

C. Student Seminar: Minimum of once every 1-2 weeks is suggested.

Important topics should be selected as per subject requirements and allotted for in-depth study by a postgraduate student. A teacher should be allocated for each seminar as faculty moderator to help the student prepare the topic well. It should aim at comprehensive evidence-based review of the topic. The student should be graded by the faculty and peers.

D. Student Symposium: Minimum of once every 3 months.

A broad topic of significance should be selected, and each part shall be dealt by one postgraduate student. A teacher moderator should be allocated for each symposium and moderator should track the growth of students. The symposium should aim at an evidence-based exhaustive review of the topic. All participating postgraduates should be graded by the faculty and peers.

E. Laboratory work / Bedside clinics: Minimum - once every 1-2 weeks.

Laboratory work/Clinics/bedside teaching should be coordinated and guided by faculty from the department. Various methods like DOAP (Demonstrate, Observe, Assist, Perform), simulations in skills lab, and case-based discussions etc. are to be used. Faculty from the department should participate in moderating the teaching-learning sessions during clinical rounds.

F. Interdepartmental colloquium

Faculty and students must attend monthly meetings between the main Department and other department/s on topics of current/common interest or clinical cases.

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G. (a). Rotational clinical / community / institutional postings

Depending on local institutional policy and the subject specialty needs, postgraduate trainees may be posted in relevant departments/ units/ institutions. The aim would be to acquire more in-depth knowledge as applicable to the concerned specialty. Postings would be rotated between various units/departments and details to be included in the specialty-based Guidelines. Few examples are listed below:

- Broad specialty departments
- Emergency/Casualty department
- Super specialty departments e.g. Cardiology / Endocrinology / Nephrology / Medical Oncology etc.
- Laboratory-based specialty units/departments e.g. Biochemistry/Microbiology/ Infection control unit/Laboratory Medicine etc.

G. (b). Posting under "District Residency Programme" (DRP):

All postgraduate students pursuing MS/MS in broad specialties in all Medical Colleges/Institutions shall undergo a compulsory rotation of three months in District Hospitals/District Health System as a part of the course curriculum, as per the Postgraduate Medical Education (Amendment) Regulations (2020). Such rotation shall take place in the 3rd or 4th or 5th semester of the Postgraduate programme and the rotation shall be termed as "District Residency Programme" and the PG medical student undergoing training shall be termed as "District Resident".

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Every posting should have its defined learning objectives. It is recommended that the departments draw up objectives and guidelines for every posting offered in conjunction with the collaborating department/s or unit/s. This will ensure that students acquire expected competencies and are not considered as an additional helping hand for the department / unit in which they are posted. The PG student must be tagged along with those of other relevant departments for bedside case discussion/basic science exercises as needed, under the guidance of an assigned faculty.

Opportunities to present and discuss infectious disease cases through bedside discussion and ward/grand rounds with specialists / clinicians in different hospital settings must be scheduled to address antimicrobial resistance issues and strategies to deal with it.

H. Teaching research skills

Writing a thesis should be used for inculcating research knowledge and skills. All postgraduate students shall conduct a research project of sufficient depth to be presented to the University as a postgraduate thesis under the supervision of an eligible faculty member of the department as guide and one or more co-guides who may be from the same or other departments.

In addition to the thesis project, every postgraduate trainee shall participate in at least one additional research project that may be started or already ongoing in the department. It is preferable that this project will be in an area different from the thesis work. For instance, if a clinical research project is taken up as thesis work, the additional project may deal with community/field/laboratory work. Diversity of knowledge and skills can thereby be reinforced.

I. Training in teaching skills

MEU/DOME should train PG students in education methodologies and assessment techniques. The PG students shall conduct UG classes in various courses and a faculty shall observe and provide feedback on the teaching skills of the student.

J. Log book

During the training period, the postgraduate student should maintain a Log Book indicating the duration of the postings/work done in Wards, OPDs, Casualty and other areas of posting. This should indicate the procedures assisted and performed and the teaching sessions attended. The log book entries must be done in real time. The log book is thus a record of various activities by the student like: (1) Participation & performance, (2) attendance, (3) participation in sessions, (4) completion of pre-determined activities, and (5) acquisition of selected competencies.

The purpose of the Log Book is to:

a) help maintain a record of the work done during training,
b) enable Faculty/Consultants to have direct information about the work done and intervene, if necessary,
c) provide feedback and assess the progress of learning with experience gained periodically.
d) Documentation of acquisition required competencies

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The Log Book should be used in the internal assessment of the student; should be checked and assessed periodically by the faculty members imparting the training. The PG students will be required to produce completed log book in original at the time of final practical examination. It should be signed by the Head of the Department. A proficiency certificate from the Head of Department regarding the clinical competence and skillful performance of procedures by the student will be submitted by the PG student at the time of the examination.

The PG students shall be trained to reflect and record their reflections in log book particularly of the critical incidents. Components of good teaching practices must be assessed in all academic activity conducted by the PG student and at least two sessions dedicated for assessment of teaching skills must be conducted every year of the PG program. The teaching faculty are referred to the MCI Logbook Guidelines uploaded on the Website.

K. **Course in Research Methodology**: All postgraduate students shall complete an online course in Research Methodology within six months of the commencement of the batch and generate the online certificate on successful completion of the course.

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Other aspects

- The Postgraduate trainees must participate in the teaching and training program of undergraduate students and interns attending the department.
- Trainees shall attend accredited scientific meetings (CME, symposia, and conferences) at least once a year.
- Department shall encourage e-learning activities.
- The Postgraduate trainees should undergo training in Basic Cardiac Life Support (BCLS) and Advanced Cardiac Life Support (ACLS).
- The Postgraduate trainees must undergo training in information technology and use of computers.

During the training program, patient safety is of paramount importance; therefore, relevant clinical skills are to be learnt initially on the models, later to be performed under supervision followed by independent performance. For this purpose, provision of skills laboratories in medical colleges is mandatory.

ASSESSMENT

FORMATIVE ASSESSMENT, ie., assessment to improve learning

Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self-directed learning and ability to practice in the system.

General Principles

Internal Assessment should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills.

The Internal Assessment should be conducted in theory and practical/clinical examination, should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills.

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Quarterly assessment during the MD training should be based on:

- Case presentation, case work up, case handling/management : once a week
- Laboratory performance : twice a week
- Journal club : once a week
- Seminar : once a fortnight
- Case discussions : once a fortnight/month
- Interdepartmental case or seminar : once a month

Note: These sessions may be organized and recorded as an institutional activity for all postgraduates.

- Attendance at Scientific meetings, CME programmes (at least 02 each)

The student to be assessed periodically as per categories listed in appropriate (non-clinical/clinical) postgraduate student appraisal form (Annexure I).

SUMMATIVE ASSESSMENT, ie., assessment at the end of training

Essential pre-requisites for appearing for examination include:

1. **Log book** of work done during the training period including rotation postings, departmental presentations, and internal assessment reports should be submitted.

2. At least **two presentations** at national level conference. One research paper should be published / accepted in an indexed journal**. (It is suggested that the local or University Review committee assess the work sent for publication).**

The summative examination would be carried out as per the Rules given in the latest POSTGRADUATE MEDICAL EDUCATION REGULATIONS. The theory examination shall be held in advance before the Clinical and Practical examination, so that the answer books can be assessed and evaluated before the commencement of the clinical/Practical and Oral examination**.**

The postgraduate examination shall be in three parts**:**

1. **Thesis**

   Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination. The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination. A post graduate student in broad specialty shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners**.**

2. **Theory examination**

   The examinations shall be organized on the basis of 'Grading' or 'Marking system' to evaluate and to certify post graduate student's level of knowledge, skill and competence at the end of the training, as given in the latest POSTGRADUATE MEDICAL EDUCATION REGULATIONS. Obtaining a minimum of 50% marks in 'Theory' as well as 'Practical' separately shall be mandatory for passing examination as a whole. The examination for M.D./ M.S shall be held at the end of 3rd academic year.

   There shall be four theory papers (as per PG Regulations).

   Paper I: Basic sciences as applied to the subject

   Paper II: Therapeutics & Tropical Medicine

   Paper III: Sytstemic Medicine of all organ systems

   Paper IV: Recent advances in the subject.

3. **Practical/clinical and Oral/viva voce examination**

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Practical examination

Practical examination should be spread over **two** days and include various major components of the syllabus focusing mainly on the psychomotor domain.

Oral/Viva voce examination on defined areas should be conducted by each examiner separately. Oral examination shall be comprehensive enough to test the post graduate student's overall knowledge of the subject focusing on psychomotor and affective domain.

The final clinical examination in broad specialty clinical subjects should include:

- Cases pertaining to major systems (eg. one long case and three short cases)
- Stations for clinical, procedural and communication skills
- Log Book Records and reports of day-to-day observation during the training
- It is emphasized that Oral/viva voce examination shall be comprehensive enough to test the post graduate student's overall knowledge of the subject.

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Recommended Reading:

Text Books (latest edition)

1. API Text book of Medicine
2. Davidson's Principles and Practice of M
3. Harrison's Principles & Practice of Medicine
4. Oxford Text book of Medicine
5. Kumar & Clark: Book of Clinical Medicine
6. Cecil: Text Book of Medicine
7. Current medical diagnosis and treatment
8. Washington manual of medical therapeutics
9. Krishnadas. K.V: Text Book of Medicine

Journals

03-05 international Journals and 02 national (all indexed) journals.

Annexure 1

Student appraisal form for MD in General Medicine											
	Element	**Less than Satisfactory**			**Satisfactory**			**More than satisfactory**			**Comments**
		1	2	3	4	5	6	7	8	9	
1	**Scholastic Aptitude and Learning**										
1.1	Has Knowledge appropriate for level of training										
1.2	Participation and contribution to learning activity (e.g., Journal Club, Seminars, CME etc)										
1.3	Conduct of research and other scholarly activity assigned (e.g Posters, publications etc)										
1.4	Documentation of acquisition of competence										
	(eg Log book)										
1.5	Performance in work based assessments										
1.6	Self- directed Learning										
2	**Care of the patient**										
2.1	Ability to provide patient care appropriate to level of training										
2.2	Ability to work with other members of the health care team										
2.3	Ability to communicate appropriately and empathetically with patients families and care givers										
2.4	Ability to do procedures appropriate for the level of training and assigned role										
2.5	Ability to record and document work accurately and appropriate for level of training										

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2.6	Participation and contribution to health care quality improvement										
3	**Professional attributes**										
3.1	Responsibility and accountability										
3.2	Contribution to growth of learning of the team										
3.3	Conduct that is ethical appropriate and respectful at all times										
4	**Space for additional comments**										
5	**Disposition**										
	Has this assessment been discussed with the trainee?	Yes	No								
	If not explain										
	Name and Signature of the assesse										
	Name and Signature of the assessor										
	Date										

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NATIONAL MEDICAL COMMISSION
Postgraduate Medical Education Board

D 11011/1/22/AC/Guidelines/PG 08 **Date: 01-08-2022**

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GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR MD IN PHARMACOLOGY

GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR MD IN PHARMACOLOGY

Preamble

The purpose of the postgraduate (PG) education is to create specialists who would provide high quality education, health care and advance the cause of science through research and training.

Pharmacology consists of both experimental and clinical sciences. The experimental component is essential in understanding the drug action in diseases as well as for the research in drug discovery and development. Clinical application of pharmacology concepts is essential for rational prescribing practices, rational therapeutics, clinical trials, rational use of drugs including antimicrobials, pharmacovigilance and pharmacology consults.

The job prospects for a medical pharmacologist have evolved over time along with a congruent rise in the demand for trained pharmacologists in India, both in academics as well in other areas such as pharmacovigilance centres, regulatory bodies, national research institutes, pharmaceutical industry and as scientific writers or science managers. Hence, a PG student in Pharmacology should be competent to meet the growing challenges in job requirements at all levels in various fields and organizations.

Considering the emerging trends in pharmacology & therapeutics, clinical applications of the subject, its role in national programs, evolving integrated course schedules while broadening the subject scope and number of students seeking to join the PG degree in pharmacology, there is huge demand to standardize and update PG curricular components including competencies, teaching learning methods and assessment methods in the MD pharmacology course in India. This requires integration of pharmacology with other sciences including basic, para-clinical and clinical disciplines.

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A pragmatic approach to postgraduate pharmacology teaching in India is a key step towards addressing the aforesaid challenges and facilitating a fresh curriculum design. The purpose of this document is to provide teachers and learners comprehensive guidelines to achieve the defined competencies through various teaching-learning and assessment strategies. This document was prepared by various subject and education experts of the national Medical Commission. The subject Expert Group has attempted to render uniformity without compromising the purpose and content of the document. Compromise in purity of syntax has been made in order to preserve the purpose and content. This has necessitated retention of "domains of learning" under the heading "competencies".

SUBJECT SPECIFIC LEARNING OBJECTIVES (GOALS)

At the end of the MD training programme in Pharmacology, the student should meet the following goals:

1. **Acquisition of knowledge**

The student should be able to clearly explain concepts and principles of pharmacology and therapeutics, drug development processes, the drugs and cosmetics act, rational use of drugs, antimicrobial resistance, pharmacovigilance, pharmacy, health economics, clinical trial processes and relevant national programs.

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2. **Acquisition of Skills**

The student should be able to develop and apply skills in pharmacology-based services (e.g. rational prescribing), in self-directed learning for evolving educational needs and scientific information, in conduct of research and in managerial assignments in the department/institution.

3. **Teaching and training**

The student should be able to effectively teach and assess undergraduate medical students (MBBS) and allied health science courses (Dentistry, Nursing, Physiotherapy) so that they become competent healthcare professionals and are able to contribute to training of undergraduates (UG) and postgraduates.

4. **Research**

The student should be able to conduct a research project (in both basic and clinical pharmacology) from the planning to the publication stage and be able to pursue academic interests and continue life-long learning to become a more experienced teacher & mentor in all the above areas and to eventually be able to guide postgraduates in their thesis, research work and all other academic activities.

5. **Professionalism, Ethics and Communication skills**

The student should be able to learn and apply principles of professionalism, ethics and effective communication in conduct of research, pharmacology-based services, educational activities and day to day work.

SUBJECT SPECIFIC COMPETENCIES

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The competencies will have a judicious mix of all domains of learning and usually are predominant in one domain. The postgraduate student during the training program should acquire the following competencies to achieve the defined five goals:

A. Predominant in Cognitive domain

The MD Pharmacology student after training in the course should be able to:

General Pharmacology:

1. Demonstrate an understanding of the basic principles of Pharmacology including molecular pharmacology.
2. Demonstrate an awareness of the historical journey and contributions of scientists in the drug development process.
3. Describe the process of new drug development including preclinical and clinical phases.
4. Describe principles of pharmacokinetics of drugs and apply these to prescribe medicines for individualization of pharmacological therapy, including use of medicines in special categories (Pediatrics, Geriatrics, Pregnancy and Pathological states).

5. Explain the principles of pharmacodynamics and apply these in different therapeutic situations.
6. Describe mechanisms of drug-drug interactions and their clinical importance.
7. Describe the principles of pharmacogenomics and its clinical significance.
8. Describe pharmacological principles underlying the effects of drugs used in diagnosis, prevention and treatment of common systemic diseases in man.
9. Demonstrate an understanding of the factors that modify drug action.
10. Define Therapeutic Drug Monitoring (TDM), describe the methods of TDM and importance in therapeutic decision making.
11. Describe the principles and importance of Pharmacoeconomics in healthcare delivery. Describe the methods in pharmacoeconomic studies and the economic considerations in the use of medicines in individuals and in the community.
12. Describe the principles, methods and importance of pharmacoepidemiology, including drug utilization studies.
13. Define pharmacovigilance. Describe the importance of pharmacovigilance in ensuring patient safety and the various methods/procedures in pharmacovigilance.
14. Describe the role of Essential Medicines in rational therapeutics. Describe principles for selecting Essential Medicines for a defined healthcare delivery system.
15. Demonstrate an understanding of principles of rational prescribing.
16. Demonstrate an understanding of prescription analysis and be able to conduct prescription analysis in a healthcare facility.
17. Demonstrate an understanding of antimicrobial resistance, antibiogram, antimicrobial stewardship program and strategies for containment of antimicrobial resistance.

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Systemic Pharmacology:

1. Apply and integrate knowledge of pathophysiology of diseases and pharmacological principles underlying the effects of drugs, for the purpose of diagnosis, prevention and treatment of common systemic diseases in man including disorders of:
    a. Synaptic & neuroeffector junctional sites of the autonomic nervous system
    b. Neuromuscular junction

c. Central nervous system
d. Cardiovascular system
e. Endocrine system
f. Gastrointestinal system
g. Respiratory system
h. Renovascular system
i. Hematological system
j. Immunological system
k. Autacoids

(Note: The above is only an indicative list).

2. Describe the mechanism of action, pharmacological effects and therapeutic status of drugs used for prevention and management of microbial and parasitic infections/infestations and neoplastic disorders.
3. Describe the pathophysiological basis and management of common poisonings.
4. Demonstrate an awareness about the recent advances in pharmacology and therapeutics.
5. Demonstrate an understanding of the special considerations in pharmacokinetics, mechanism of action, pharmacological effects and therapeutic status of drugs used for dermatological and ocular disorders.

Research:

1. Demonstrate an understanding of the importance and ethical considerations of biomedical research in animals and man.
2. Describe the principles and methods of biomedical research in animals and man.
3. Describe the current principles of Good Clinical Practice (GCP) and Good Laboratory Practice (GLP) guidelines, as applicable.
4. Demonstrate an understanding of the different tools and methods for literature search.
5. Describe and apply the principles of biostatistics in the evaluation and interpretation of efficacy and safety studies of drugs in man. Apply and interpret the various statistical tools in biomedical research.
6. Demonstrate an understanding of the principles of Good Publication practices as applicable to publication of research studies.

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7. Describe different methods of drug assays - biological, chemical, immune-assay including knowledge of analytical techniques like HPLC, TLC etc. and their applications in therapeutics.
8. Describe the methods for screening/evaluation of **a**nalgesics, antipyretics, anticonvulsants, anti-inflammatory drugs, antidepressants, antianxiety and antipsychotics, sedatives, muscle relaxants, antihypertensives, hypocholesterolemic agents, antiarrhythmic drugs, diuretics, adrenergic blocking drugs, drugs affecting learning and memory in animals and man. *(Note: This is only an indicative list).*
9. Describe the regulatory and ethical issues involved in drug development and research.

Teaching and Assessment:

1. Demonstrate an awareness about the salient features of Undergraduate Medical Education Curriculum in India.
2. Demonstrate an awareness about Postgraduate Medical Education Curriculum and Guidelines in India.
3. Describe the principles of teaching-learning technology and apply these to conduct classroom lectures, self-directed learning (SDL) sessions, Case-Based Learning (CBL), case discussions, integrated teaching, small group discussions, seminars, journal club and research presentations.
4. Describe the principles of assessment of learning and be able to use the different methods for assessment of undergraduate students in pharmacology.
5. Demonstrate knowledge about the utility of computer assisted learning and be able to use them efficiently to promote learning of pharmacology.

Note: *The list mentioned above is indicative. A postgraduate student is expected to be knowledgeable about all aspects of the subject and be updated about the contemporary advances and research in the subject.*

B. Predominant in Affective Domain

The students after training in the MD (Pharmacology) course should be able to:

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1. Effectively explain to patients, the effects, appropriate use and adverse effects of drugs, including drug interactions and the need for medication adherence.
2. Communicate effectively with students, peers, staff, faculty and other members of the health care team about rational use of medicines and improving spontaneous reporting of adverse drug reactions, with pharmacological reasoning
3. Demonstrate respect in interactions with peers, patients and other healthcare professionals.
4. Demonstrate professionalism, ethical behavior and integrity in one's work.
5. Demonstrate ability to generate awareness about the use of generic drugs in various conditions.
6. Acquire skills for self-directed learning to keep up with advances in the subject and to improve the skills and expertise towards continuous professional development.

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C. Predominant in Psychomotor Domain

a. Mandatory

i. The students after training in the MD (Pharmacology) course should be able to *perform the following procedures independently* or as a part of a team and/or interpret the results:

1. Predict, report, monitor and participate in the management and causality assessment of adverse drug reactions associated with use of drugs, as per national program.
2. Demonstrate skills for writing rational prescriptions and prescription analysis.
3. Demonstrate proper use of equipment following the SOPs e.g. organ bath, analgesiometer, physiograph, convulsiometer, plethysmograph, equipment for testing/measuring learning and memory, affective disorders, muscle relaxants, blood pressure, ECG, respiration and pain.
4. Prepare drug solutions of appropriate strength and volume.
5. Determine EC_{50}, ED_{50}, pD2 and pA_2 values of drugs.
6. Demonstrate presentation skills in a classroom setting as well as in academic meetings at local and national levels.
7. Provide critical appraisal of a research paper.

8. Perform experiments to demonstrate and interpret the dose response curve and effect of agonists (in the presence or absence of an antagonist) on simulations.
9. Perform the following:
    - Design protocol for evaluation of a given drug for various phases of clinical trials.
    - Prepare Informed Consent Form and Participant Information Sheet for clinical trials/research.
    - Administer Informed Consent Form
    - Evaluate promotional drug literature
    - Prepare "Package insert"
    - Calculate and interpret pharmacokinetic parameters of a drug from a given data
    - Demonstrate skills to prepare material for teaching-learning and assessment.

ii. The students after training in the MD (Pharmacology) course should be able to ***do/perform following procedures under supervision***:

10. Test and predict efficacy of drugs following appropriate guidelines and regulations e.g. drugs affecting memory and psychomotor functions (e.g. critical flicker fusion tests in human volunteers), pain, cardiovascular functions, respiratory functions etc.
11. Observe and understand basic principles of working of important contemporary drug analytical techniques, interpret the observations about the drug levels and their therapeutic applications.
12. Demonstrate skills for contributing to antibiotic stewardship program of the institute to manage antimicrobial resistance.
13. Demonstrate Standard Operating Procedures (SOPs) for various methods and techniques used in pharmacology including SOPs in clinical trials and research.
14. Administer drugs by various routes (subcutaneous, intravenous, intraperitoneal) in simulations and hybrid models.
15. Demonstrate acquisition of writing skills for scientific publications and research projects for funding agencies and approval by Ethics Committee.
16. Demonstrate scientific writing skills.

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b. Desirable: The students after training in the MD (Pharmacology) course should be able to:

17. Collect blood samples and oral gavage from experimental animals.
18. Administer drugs by various routes (subcutaneous, intravenous, intraperitoneal) in experimental animals.
19. Perform *in vivo* and *in vitro* animal experiments or simulated experiments, interpret the observations and relate these to potential clinical applications of the experimental drug:

    e.g. - effect of mydriatics and miotics on rabbit eye,

    - effect of anti-epileptic drugs using appropriate animal models of epilepsy,
    - effect of analgesics using appropriate animal models of analgesia, and
    - effect of drugs on learning, memory and motor coordination and effect of local anesthetics.

    These are examples, but the list is not limited to this only.
20. Perform experiments to demonstrate and interpret the dose response curve and effect of agonists (in the presence or absence of an antagonist) on various biological tissues.

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Animal Experiments: All animal experiments must be compliant with the Regulations of Government of India, notified from time to time. Amphibian/Dog/Cat experiments should be conducted by computer assisted simulation models/facilities. Other experiments can be performed, but as permissible by existing 'Committee for the Purpose of Control and Supervision of Experiments on Animals (CPCSEA)' guidelines and other Government regulations.

SYLLABUS

The course contents should cover the following broad topics:

1. History of Pharmacology and medicine
2. Basic and molecular pharmacology
3. Drug receptors and Pharmacodynamics
4. Pharmacokinetics (Absorption, Distribution, Biotransformation, Excretion & kinetic parameters)

5. Therapeutic Drug Monitoring
6. Drugs acting on synaptic and neuroeffector junctional sites
7. Autonomic pharmacology
8. Drugs acting on central nervous system
9. Drugs modifying renal functions
10. Drugs acting on cardiovascular system and hemostatic mechanisms
11. Reproductive Pharmacology
12. Agents affecting calcium homeostasis
13. Autacoids and related pharmacological agents (analgesics) and drugs used in Rheumatoid arthritis and Gout
14. Drugs acting on Gastrointestinal system
15. Pharmacology of drugs affecting the respiratory system
16. Chemotherapy- General principles and various antimicrobials
17. Chemotherapy of neoplastic disease
18. Drugs used in Autoimmune disorder and Graft versus Host Disease
19. Dermatological pharmacology
20. Ocular pharmacology
21. Use of drugs in special population
22. Immunomodulators - immunosuppressants and immunostimulants
23. Pharmacology of drugs used in endocrine disorders
24. Drug delivery systems
25. Heavy metal poisoning
26. Non-metallic toxicants - air pollutants, pesticides etc.
27. Research methodology and biostatistics
28. Pharmacogenomics, pharmacovigilance, pharmacoeconomics and pharmacoepidemiology
29. Over the counter drugs, essential medicines, P-drug, commonly used Over-The-Counter (OTC) drugs, generic drugs, drugs banned in India
30. Principles of rational use of drugs and rational prescribing
31. Dietary supplements and herbal medicines
32. Pathophysiological basis and management of common poisonings
33. National programmes for infectious and vector borne diseases including the regimes.
34. Professionalism & ethics

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35. Clinical pharmacology

- Functioning of the Drugs and Therapeutics Committee.
- Hospital formulary development.
- Drug information services.
- Medication error detection and mitigation advice.
- Antimicrobial resistance and antibiotic stewardship.
- Prescription auditing
- Drug counseling - explain to patients, the effects and adverse effects of drugs, including the need for medication adherence
- Emergency drugs used in crash cart/ resuscitation

36. Drug development research and Regulations

- Principles of Good Clinical Practice (GCP) and Good Laboratory Practice (GLP) guidelines, and Good publication practices
- Recent regulatory guidelines for drugs/research and clinical trials
- Drug development and research and ethical issues involved in it
- Research protocol development, research study conduct, experimental observations, analysis of data using currently available statistical software
- Emergency use authorization for drugs eg., vaccine development

37. Pharmacometrics - methods of drug evaluation.

38. General screening and evaluation of:

- analgesics, antipyretics, anticonvulsants, anti-inflammatory drugs, antidepressants, antianxiety and antipsychotics, sedatives, muscle relaxants, antihypertensives, hypocholesterolemic agents, anti-arrhythmic drugs, diuretics, adrenergic blocking drugs, local anaesthetics, antifertility agents, antidiabetics, drugs used in peptic ulcer diseases and drugs affecting learning and memory in animals and man.

39. Experimentation

- Bioassay methods
- Animal experiments: Ethical considerations, ethical approval, applicable Regulatory Guidelines, humane animal research (principles of 3Rs) and alternatives to animal experimentation. General and statistical considerations

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- Anesthetics used in laboratory animals
- Principles of EC50, ED50, pD2 and pA2 values of drugs
- Describe methods of bioassay for estimation of:
  Acetylcholine, skeletal neuromuscular junction blockers, adrenaline, noradrenaline, histamine, 5 HT, hormones, insulin, vasopressin/oxytocin, estrogen, progestins, ACTH
- Competitive antagonism - pA2 values
- Immunoassays: Concept, types of bioassays and their application/s
- Animal experiments: Ethical consideration, Ethics Committee and ethical approval
- Regulatory Guidelines and alternatives to animal experimentation.

40. Biochemical Pharmacology

- Basic principles and applications of simple analytical methods
- Principles of quantitative estimation of drugs, endogenous compounds and poisons using Colorimetry, Spectrophotometry, flame photometry, High Performance Liquid Chromatography (HPLC) and enzyme-linked immunosorbent assay (ELISA).

41. Education

- Salient features of Undergraduate Medical Education Curriculum in India.
- Postgraduate Medical Education Curriculum and Guidelines in India.
- Principles of teaching - learning methods and technology
- Principles of assessment of learners

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TEACHING AND LEARNING METHODS

General principles

Acquisition of competencies being the keystone of doctoral medical education, such training should be skills oriented. Learning in the program, essentially autonomous and self-directed, and emanating from academic and clinical work, shall also include assisted learning. The formal sessions are meant to supplement this core effort.

All students joining the postgraduate courses shall work as full-time (junior) residents during the period of training, attending not less than 80% of the training activity during the calendar year, and participating in all assignments and facets of the educational process. They shall maintain a log book for recording the training they have undergone, and details of the procedures done during laboratory and clinical postings in real time.

Teaching-Learning methods

This should include a judicious mix of demonstrations, symposia, journal clubs, clinical meetings, seminars, small group discussions, bed-side teaching, case-based learning, simulation-based teaching, self-directed learning, integrated learning, interdepartmental meetings and any other collaborative activity with the allied departments. Methods with exposure to the applied aspects of the subject relevant to basic/clinical sciences should also be used.

The suggested examples of teaching-learning methods are given below but are not limited to these. The frequency of various below mentioned teaching-learning methods can vary based on the subject's requirements, competencies, work load and overall working schedule of the department.

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A. Lectures: Didactic lectures should be used sparingly. A minimum of 10 lectures per year in the concerned PG department is suggested. Topics to be selected as per subject requirements. All postgraduate trainees will be required to attend these lectures. Lectures can cover topics such as:

1. Subject related important topics
2. Recent advances
3. Research methodology and biostatistics
4. Salient features of Undergraduate/postgraduate medical curriculum
5. Teaching and assessment methodology
6. Toxicity studies
7. Screening for pharmacological activity of drugs
8. Technical and ethical issues in clinical research and practice
9. Good laboratory practice
10. Good manufacturing practice
11. Health economics

No 3, 4, 5 can be done in the course of research/biostatistics and medical education workshops in the institute.

B. Journal club: Minimum of once in 1-2 weeks is suggested.

Topics will include presentation and critical appraisal of original research papers published in peer reviewed indexed journals. The presenter(s) shall be assessed by faculty and grades recorded in the logbook.

C. Student Seminar: Minimum of once every 1-2 weeks is suggested.

Important topics should be selected as per subject requirements and allotted for in-depth study by a postgraduate student. A teacher should be allocated for each seminar as faculty moderator to help the student prepare the topic well. It should aim at comprehensive evidence-based review of the topic. The student should be graded by the faculty and peers.

D. Student Symposium: Minimum once every 3 months.

A broad topic of significance should be selected, and each part shall be dealt by one postgraduate student. A teacher moderator should be allocated for each symposium and moderator should track the growth of students during moderation. It should aim at complete evidence-based review of the topic. All participating postgraduates should be graded by the faculty and peers.

E. Laboratory work / Bedside clinics: Minimum - once every 1-2 weeks.

Laboratory work/clinics/bedside teaching should be coordinated and guided by faculty from the department. Various methods like DOAP (Demonstrate, Observe, Assist, Perform), simulations in skill lab, and case-based discussions etc. are to be used. Faculty from the department should participate in moderating the teaching-learning sessions during clinical rounds.

F. Interdepartmental colloquium

Faculty and students must attend monthly meetings between the Department of Pharmacology and another department or departments on topics of current/common interest or clinical cases.

G. a. Rotational clinical / community / institutional postings

Depending on local institutional policy and the subject specialty needs, postgraduate trainees may be posted in relevant departments/ units/ institutions. The aim would be to acquire more in-depth knowledge as applicable to the concerned specialty. Postings would be rotated between various units/departments.

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The postings schedule with duration is given below:

- Medicine -2 weeks
- Anesthesia -2 weeks
- Dermatology -1 week
- Medical oncology -2 weeks (if available)
- Microbiology/ Infection control unit or dept -2 weeks
- Biochemistry -2 weeks
- Hospital Pharmacy -1 week (if available)
- Clinical trial unit/Research unit/ Pharmaceutical industry -2-8 weeks (as per availability)
- Medical Education Unit (MEU) or Department of Medical Education (DOME) -1 week (optional)

G b. Posting under "District Residency Programme" (DRP):

All postgraduate students pursuing MD in Pharmacology in all Medical Colleges/Institutions shall undergo a compulsory rotation of three months in District Hospitals/District Health System as a part of the course curriculum, as per the Postgraduate Medical Education (Amendment) Regulations (2020). Such rotation shall take place in the 3rd or 4th or 5th semester of the Postgraduate programme and the rotation shall be termed as "District Residency Programme" and the PG medical student undergoing training shall be termed as "District Resident".

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Every posting should have its defined learning objectives. It is recommended that the departments draw up objectives and guidelines for every posting offered in conjunction with the collaborating department/s or unit/s. This will ensure that students acquire expected competencies and are not considered as an additional helping hand for the department / unit in which they are posted. The PG student must be tagged along with those of other relevant departments for bedside case discussion/basic science exercises as needed, under the guidance of an assigned faculty.

Opportunities to present and discuss infectious disease cases through bedside discussion and ward/grand rounds with specialists / clinicians in different

hospital settings must be scheduled to address antimicrobial resistance issues and strategies to deal with it.

H. Teaching research skills

Writing a thesis should be used for inculcating research knowledge and skills. All postgraduate students shall conduct a research project of sufficient depth to be presented to the University as a postgraduate thesis under the supervision of an eligible faculty member of the department as guide and one or more co-guides who may be from the same or other departments.

In addition to the thesis project, every postgraduate trainee shall participate in at least one additional research project that may be started or already ongoing in the department. It is preferable that this project will be in an area different from the thesis work. For instance, if a clinical research project is taken up as thesis work, the additional project may deal with community/field/laboratory work. Diversity of knowledge and skills can thereby be reinforced.

I. Training in teaching skills

Medical Education Unit (MEU)/ Department of Medical education (DOME) should train PG students in education methodologies and assessment techniques. The PG students shall conduct UG classes in various courses and a faculty shall observe and provide feedback on teaching skills to the student.

J. Log book

During the training period, the postgraduate student should maintain a Log Book indicating the duration of the postings/work done in Wards, OPDs, Casualty and other areas of posting. This should indicate the procedures assisted and performed and the teaching sessions attended. The log book entries must be done in real time. The log book is thus a record of various activities by the student like: (1) Overall participation & performance, (2) attendance, (3) participation in sessions, (4) record of completion of pre-determined activities, and (5) acquisition of selected competencies.

The purpose of the Log Book is to:

a) help maintain a record of the work done during training,
b) enable Faculty/Consultants to have direct information about the work done and intervene, if necessary,

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c) provide feedback and assess the progress of learning with experience gained periodically.

The Log Book should be used in the internal assessment of the student, should be checked and assessed periodically by the faculty members imparting the training. The PG students will be required to produce completed log book in original at the time of final practical examination. It should be signed by the Head of the Department. A proficiency certificate from the Head of Department regarding the clinical competence and skillful performance of procedures by the student will be submitted by the PG student at the time of the examination.

The PG students shall be trained to reflect and record their reflections in log book particularly of the critical incidents. Components of good teaching practices must be assessed in all academic activity conducted by the PG student and at least two sessions dedicated for assessment of teaching skills must be conducted every year of the PG program. The teaching faculty are referred to the MCI Logbook Guidelines uploaded on the Website.

K. Course in Research Methodology: All postgraduate students shall complete an online course in Research Methodology within six months of the commencement of the batch and generate the online certificate on successful completion of the course.

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L. Other aspects

- The postgraduate trainees must participate in the teaching and training program of undergraduate students and interns attending the department.
- Trainees shall attend accredited scientific meetings (CME, symposia, and conferences) at least once a year.
- Department shall encourage e-learning activities.
- The postgraduate trainees must undergo compulsory training in Basic Cardiac Life Support (BCLS) and Advanced Cardiac Life Support (ACLS).
- The postgraduate trainees must undergo training in information technology and use of computers.

- The postgraduate trainees should preferably undergo training in Good Clinical Practice (GCP)

During the training program, patient safety is of paramount importance; therefore, relevant clinical skills are to be learnt initially on the models, later to be performed under supervision followed by independent performance. For this purpose, provision of skills laboratories in medical colleges is mandatory.

ASSESSMENT

FORMATIVE ASSESSMENT, i. e., assessment to improve learning

Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self-directed learning and ability to practice in the system.

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General Principles

The Internal Assessment should be conducted in theory and practical/clinical examination, should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills. The Internal Assessment should include quarterly assessment.

Quarterly assessment during the MD training should be based on:

- Case presentation, case work up, case handling/management : once a week
- Laboratory performance : twice a week
- Journal club : once a week
- Seminar : once a fortnight
- Case discussions : once a fortnight/month
- Interdepartmental case or seminar : once a month

Note: These sessions may be organized and recorded as an institutional activity for all postgraduates.

- Attendance at Scientific meetings, CME programmes (at least 02 each)

Important instructions:

- The feedback should be given to students timely and frequently so that they get a chance to improve.
- All teachers of the Department should be involved in assessment.
- The records and Log book shall be checked and assessed periodically by the faculty members imparting the training.

The student to be assessed periodically as per categories listed in postgraduate student appraisal form (Annexure I).

SUMMATIVE ASSESSMENT, i.e., assessment at the end of training

Essential pre-requisites for appearing for examination include:

1. **Log book** of work done during the training period including rotation postings, departmental presentations, and internal assessment reports should be submitted.

2. At least **two presentations** at national level conference. One research paper should be published / accepted in an indexed journal**. (It is suggested that the local or University Review committee assess the work sent for publication).**

The summative examination would be carried out as per the Rules given in the latest POSTGRADUATE MEDICAL EDUCATION REGULATIONS. The theory examination shall be held in advance before the Clinical and Practical examination, so that the answer books can be assessed and evaluated before the commencement of the clinical/Practical and Oral examination**.**

The postgraduate examination shall be in three parts**:**

1. Thesis

Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination. The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination. A post graduate student in broad specialty shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners**.**

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2. Theory examination

The examinations shall be organized on the basis of 'Grading'or 'Marking system' to evaluate and to certify post graduate student's level of knowledge, skill and competence at the end of the training, as given in the latest POSTGRADUATE MEDICAL EDUCATION REGULATIONS. Obtaining a minimum of 50% marks in 'Theory' as well as 'Practical' separately shall be mandatory for passing examination as a whole. The examination for M.D./ M.S shall be held at the end of 3rd academic year.

There shall be four theory papers (as per PG Regulations).

Paper I: Basic sciences as applied to Pharmacology

Paper II: Systemic Pharmacology

Paper III: Clinical Pharmacology, Experimentation, Research, Biostatistics and Education

Paper IV: Recent advances in the Pharmacology

3. Practical/clinical and Oral/viva voce examination

Practical examination

Practical examination should be spread over **two** days and include various major components of the syllabus focusing mainly on the psychomotor domain.

Oral/Viva voce examination on defined areas should be conducted by each examiner separately. Oral examination shall be comprehensive enough to test the postgraduate student's overall knowledge of the subject focusing on psychomotor and affective domain.

Practical Examination Exercises:

a) long exercises:

- Protocol design for a given scenario
- Case audit for a given case
- Perform experiments or simulated experiments (as per PG Regulations) The exercises should be observed, response of student noted and assessed. The question related to these exercises can be asked

b) short exercises:

- Interpretation of results of a previous tracing - Table exercise

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- Demonstration of effects of drugs/interpretation of results in human
- Demonstration of effects of drugs/interpretation of results in small, animals - optional (as per Regulations notified)

  The exercises should be observed and assessed.

c) OSPE exercises: Objective Structured Practical Examination (OSPE)

OSPE should have 10-15 stations. Stations should be mixture of observed (observer present) and unobserved stations (without an observer). Few examples are given below:

- Various drug delivery systems
- Calculating pharmacokinetic parameters
- Pharmaceutical calculations
- Statistical exercise
- Pharmacoeconomics
- Critical appraisal of a published paper
- Abstract writing of a published paper
- Evaluation of drug promotional literature.
- Adverse Drug Reaction (ADR) reporting and causality assessment
- Assessment of preclinical toxicity data
- Analysis of rational and irrational formulations
- Selecting a P-drug and writing rational prescriptions
- Analytical instruments - use and interpretation
- Identifying ethics related dilemmas / mistakes in clinical trial documents

d) Assessment of teaching/presentation skills

- e.g., presentation of a UG lecture, making Question paper, Learning Objectives
- Discussion on dissertation

Recommended Readings

Books:

1. Brunton LL, Hilal-Dandan R, Knollmann BC. Goodman and Gilman's The Pharmacological Basis of Therapeutics, 13th edition, Mc Graw Hill Education, 2018.

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2. Katzung BG. Basic & Clinical Pharmacology, 14th edition, McGraw Hill Education, 2018.
3. Papadakis MA, Mcphee SJ. Current Medical Diagnosis & Treatment. 60th edition New York. McGraw Hill Education.2021.
4. Ritter M, Flower R, Henderson G, Loke YK, MacEwan D, Rang HP. Pharmacology. Elsevier, 9th edition, 2020.
5. Tripathi KD. Essentials of Medical Pharmacology, 8th edition. Jaypee Brothers Medical Publishers Private Ltd: New Delhi 2019.
6. M. N. Ghosh. Fundamentals of Experimental Pharmacology. 7th Edition. Hilton & Company, 2019.
7. Badyal D. Practical Manual of Pharmacology. Jaypee Brothers Medical Publishers; 3rd edition 2020.
8. Vogel HJ. Drug Discovery and Evaluation: Pharmacological Assays Springer; 3rd edition, 2007.
9. Sharma S, Velpandian T. Illustrated Reviews Pharmacology. Wolter Kluver, South Asian Edition, 2019.
10. Medhi B, Prakash A. Practical Manual of Experimental & Clinical Pharmacology. Jaypee Brothers Medical Publishers, 2nd edition, 2017.
11. Alldredge BK, Corelli RL, Ernst ME, Guglielmo Jr. BJ, Jacobson PA, Kradjan WA, Williams BA. Koda-Kimble and Young's Applied Therapeutics Lippincott Williams and Wilkins, 10th edition, 2012.
12. Cheston B Cunha, Burke A Cunha. Antibiotic essentials. Jaypee Brothers Medical Publishers 17th edition, 2021.

Websites:

1. National Guidelines on national programs e.g. https://cdsco.gov.in/opencms/opencms/en/Home
2. MOHFW Website https://www.mohfw.gov.in/
3. WHO Website https://www.who.int/

Journals:

03-05 international Journals and 02 national (all indexed).

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Annexure I

Student appraisal form for MD in Pharmacology											
	Elements	**Less than Satisfactory**			**Satisfactory**			**More than satisfactory**			**Comments**
		1	2	3	4	5	6	7	8	9	
1	**Scholastic aptitude and learning**										
1.1	Has knowledge appropriate for level of training										
1.2	Participation and contribution to learning activity (e.g., Journal Club, Seminars, CME etc)										
1.3	Conduct of research and other scholarly activity assigned (e.g., Posters, publications etc)										
1.4	Documentation of acquisition of competence (e.g., Log book)										
1.5	Performance in work-based assessments										
1.6	Self-directed Learning										
2	**Work related to training**										
2.1	Practical skills that are appropriate for the level of training										
2.2	Respect for processes and procedures in the work space										
2.3	Ability to work with other members of the team										
2.4	Participation and compliance with the quality improvement process at the work environment										

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2.5	Ability to record and document work accurately and appropriate for level of training										
3	**Professional attributes**										
3.1	Responsibility and accountability										
3.2	Contribution to growth of learning of the team										
3.3	Conduct that is ethically appropriate and respectful at all times										
4	**Space for additional comments**										
5	**Disposition**										
	Has this assessment pattern been discussed with the trainee?	Yes	No								
	If not explain										
	Name and Signature of the assesse										
	Name and Signature of the assessor Date										

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National Medical Commission

NATIONAL MEDICAL COMMISSION
Postgraduate Medical Education Board

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GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR MD IN MICROBIOLOGY

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Preamble

The aim of postgraduate education in Microbiology is to impart requisite clinical, diagnostic, teaching and research skills with appropriate attitude and communication competencies required in the field of Medical Microbiology.

Currently the postgraduate students of Microbiology are trained in the laboratory with minimal exposure to patient care, but with technological advances and automation in diagnostic microbiology and increasing threat of infections due to emerging & reemerging microbes, drug resistance and widening host range, a microbiologist needs to develop clinical expertise in addition to technical expertise and be available more at the bedside to develop partnership with clinician in diagnosis and management of infectious disease cases. To fulfill these expectations, the program of MD Microbiology needs to shift focus to clinical aspects of microbiology, where a student is trained in the clinical setting and is able to contribute in the clinical management along with diagnosis, prevention and control of infectious disease.

This document provides guidelines to standardize Microbiology teaching at the postgraduate level throughout the country and fulfill the expectations as a microbiologist. The new curriculum guide has given more emphasis on training in patient care setting with integration of concepts of microbiology in various clinical specialties through dedicated postings, ward rounds, case discussion etc. This document has been prepared by subject-content specialists for the National Medical Commission. The Expert Group of the National Medical Commission had attempted to render uniformity without compromise to the purpose and content of the document. Compromise in purity of syntax has been made in order to preserve the purpose and content. This has necessitated retention of “domains of learning” under the heading “competencies”.

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SUBJECT SPECIFIC OBJECTIVES (GOALS)

A postgraduate student upon successfully qualifying in the MD Microbiology examination should be able to:

1. Demonstrate competence in clinical aspects as a Microbiologist to improve patient care.
2. Demonstrate application of microbiology in different clinical settings to address diagnostic and therapeutic problems along with preventive measures.
3. Play an important role in hospital infection control by actively participating in activities of the Hospital Infection Control Committee as a team member.
4. Demonstrate competence in recording, advising and guiding use of antimicrobials judiciously for infectious diseases in routine and in special clinical situations and population.
5. Demonstrate competence in developing guideline for antibiotic usage, including formulation of antibiotic policy in hospital.
6. Demonstrate communication skills required for safe & effective laboratory practice and teaching of microbiology
7. Demonstrate skills in conducting collaborative research in the field of Clinical Microbiology and allied sciences which has significant bearing on human health and patient care.
8. Demonstrate ability to plan, execute and evaluate teaching and training assignments efficiently and effectively in Microbiology for undergraduate students as per Competency Based Medical Education (CBME).
9. Identify public health epidemiology, global health patterns of infectious diseases and effectively participate in community outreach and public health programs for investigation, prevention and control of infectious diseases.
10. Demonstrate ability to work as a member of the rapid response team and contribute to investigations of outbreaks of infectious diseases in the hospital and outbreak/epidemic/pandemic in the community.
11. Demonstrate self-directed learning skills and keep updated with recent advances in the field of clinical microbiology.

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12. Demonstrate administrative and organizational skills to establish good clinical microbiological services in a hospital and in the community in the field of clinical microbiology
13. Demonstrate effective leadership and teamwork skills while working with other members of the health care team in hospital, laboratory and community settings.
14. Demonstrate attributes of professional behavior and uphold the prestige of the discipline amongst the fraternity of doctors.

Postgraduate training

The postgraduate training should include the following components for a holistic approach-

1. Clinical Microbiology including Antimicrobial Resistance (AMR)
2. Laboratory skills in diagnostic Microbiology
3. Infection Prevention and Control Skills
4. Teaching and learning Skills
5. Research Skills
6. Attitude, Ethics and Communication skills

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The postgraduate student should develop and demonstrate competence in the above components as follows:

1. Clinical Microbiology including Antimicrobial Resistance (AMR)

i. Should be able to elicit relevant history for optimum clinico-microbiological correlation with laboratory results.

ii. Should be able to perform basic physical examination and assess the patients with any suspected infection including community acquired/ tropical infection/ sepsis/ imported infection/ hospital acquired infections and emerging and re-emerging infections.

iii. Should be able to formulate and critique diagnostic algorithms and patient care plans.

iv. Should be able to choose, interpret and communicate the results of appropriate microbiological investigation in a suspected infection.

v. Should be able to suggest optimal antimicrobial therapy, based on results of antimicrobial susceptibility tests and other investigations.

vi. Should be able to advocate antibiotic stewardship for prevention and control of AMR (detailed competencies under AMR are given in Annexure I),

vii. Should be able to educate patients/ relatives/ community on various aspects of antimicrobial use, antimicrobial drug resistance, prevention and control of infections.

2. Laboratory skills in diagnostic Microbiology

i. Should be able to demonstrate acquisition of pre-analytical, analytical and post-analytical laboratory skills to ensure quality of test results.

ii. Should be able to perform tests pertaining to basic, diagnostic, clinical and applied Microbiology.

3. Infection Prevention and Control

i. Should be able to demonstrate knowledge, skills & attitude required to detect, prevent and control health care associated infections of all types.

ii. Should be able to set up and manage Central Sterile Services Department (CSSD) and prepare effective sterilization and disinfection policy for the hospital.

iii. Should be able to demonstrate knowledge and skills about management of biomedical waste in health care setting as per recent guidelines and educate staff about risks, preventive measures and the management of occupational exposure to infectious agents.

4. Teaching and Learning Skills

i. The Medical Education Department/Unit of the institution should be able to sensitize the postgraduate students in basic concepts of medical education technologies like domains of learning, teaching skills, teaching - learning methods, lesson planning, learning resource material, assessment techniques etc.

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ii. Should be able to demonstrate good teaching skills while conducting teaching/training sessions like tutorials, demonstrations and practical for undergraduate students, laboratory technicians etc. and participate actively in the planning and conduct of assessment of students learning at various stages of formative / summative assessment.

iii. Should be able to learn by integrating with concerned subspecialty.

5. Research Skills

i. Should be able to plan, design and conduct meaningful scientific research in microbiology in collaboration with allied subjects.

ii. Should acquire expertise to write research protocol, thesis and present a research paper in the scientific forum.

iii. Should follow guidelines on ethical conduct in research.

iv. Should acquire proficiency and demonstrate ability to use biostatistics, data management.

v. Should be able to critically appraise a scientific article and have knowledge of evidence-based practice.

vi. Should acquire expertise in writing proposals for research grants and know the various sources of research funding.

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6. Communication and attitudinal skills

i. Should demonstrate the right kind of attitude, communication and ethics while dealing with clinical material and reports.

ii. Should be able to work as an effective team member and leader.

SUBJECT SPECIFIC COMPETENCIES

The competencies will have a judicious mix of all domains of learning and may show predominance in one domain. The Post-Graduate student during the training

programme should acquire the following predominant domain specific competencies to achieve the defined goals:

A) Predominant in Cognitive Domain (Knowledge):

At the end of the course, the student should have acquired knowledge in the following competencies:

Paper I: General Microbiology (GM) & Immunology (IG)

General Microbiology (GM):

i. Describe important historical events and developments in microbiology
ii. Describe nomenclature, classification, morphology, growth requirements, pathogenesis and laboratory diagnosis of different bacteria, viruses, parasites and fungi.
iii. Explain the importance of normal flora microbes, including Microbiome in health and disease.
iv. Explain the factors influencing and significance of microbial environment in health care setup.
v. Describe the epidemiology of common infectious diseases, host-parasite relationship and their significance.
vi. Describe various types of microscopes and microscopic techniques used in diagnostic microbiology.
vii. Explain various methods of isolation, identification and preservation of microbes in laboratory.
viii. Explain the type, mechanism of action and applications of microbial toxins, other virulence factors & microbial products like Bacteriocins.
ix. Explain the concept & application of various biosafety and biosecurity issues in laboratory and patient care including physical, biological containment and standard precautions.
x. Discuss the various methods of sterilization and disinfection and apply them in the laboratory and in patient care.

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xi. Explain the basic principles of bacterial genetics and applications of molecular techniques in medical microbiology.

xii. Explain the concept of microbiological surveillance including patient screening methods, organism typing and genome sequencing methodologies.

xiii. Explain the concept and application of quality assurance, quality control and accreditation in diagnostic microbiology.

xiv. Describe the significance and causes/reasons regarding emerging infectious diseases with strategies for their identification and control.

xv. Explain the concept and application of molecular biology techniques in the laboratory diagnosis of infectious diseases.

xvi. Explain the concept and use of information technology (LIS, WHO NET etc.) in microbiology laboratory effectively.

xvii. Describe the principles & implementation of animal and human ethics involved in diagnostics and research in Microbiology

xviii. Explain the principles and application of recent technological advances, automation, and application of Artificial Intelligence, nanotechnology, biosensors, bioinformatics, etc. in diagnosis & research in Microbiology.

xix. Explain the importance and methods of testing microbiology of air, water and food in patient care both in community/ hospital setting.

xx. Explain in detail about types & mechanism of action of Antimicrobial agents, their pharmacokinetics & pharmacodynamics, along with mechanism of drug resistance.

xxi. Describe types and applications of Bacteriophages in diagnostic and therapeutic of infections

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Immunology (IG)

i. Describe the structure and function of the immune system, immunological mechanisms in health and response of the host immune system to infections. (Innate and acquired immunity, Cells involved in immune response, Antigens , Immunoglobulins, Mucosal immunity, Cell mediated immunity, Cytokines, MHC complex, Immune tolerance etc)

ii. Explain the complement system and describe its role in health and disease.

iii. Describe the mechanism/s in immunological disorders (hypersensitivity, autoimmune disorders and immunodeficiency states) and discuss the laboratory methods used in their diagnosis including measurement of immunological parameters

iv. Describe the types & principles of antigen and antibody reactions and immunological techniques used in diagnostic microbiology as well as in research.

v. Describe the immunological mechanisms of transplantation and tumor immunity**.**

vi. Describe the mechanism/s and significance of immune-potentiation and immune-modulation.

vii. Describe various types, techniques and advances in the development and applications of vaccines including UIP and immunotherapy and reverse vaccinology.

viii. Explain the role of animals in immunology.

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PAPER II Clinical / Systemic Microbiology –I (CM –I)

i. Discuss in depth about the etiological agents, source, transmission, host-parasite interaction, clinical manifestations, laboratory diagnosis, treatment, prevention, epidemiology, national, international guidelines in the situations/ scenario given below:

- **Infections of various organs and systems of the human body**

Microbiological basis of infective syndromes of various organs and systems of human body viz. CVS and blood, Respiratory Tract Infections, Urinary Tract Infections, Central Nervous System infections, Reproductive Tract Infections, Gastrointestinal Tract infections, Hepatobiliary System, Skin and Soft tissue infections, Musculoskeletal system, infections of Eye, Ear and Nose etc)

PAPER III: Clinical / Systemic Microbiology – II (CM-II)

i. Discuss in depth about the etiological agents, source, transmission, host-parasite interaction, clinical manifestations, laboratory diagnosis, treatment, prevention, epidemiology, national, international guidelines in the situations/ scenario given below:

- **Infectious diseases as per the source/risk**

- **Opportunistic Infections** in special and high risk host
- **Infections in special situations/ scenario**.

Microbiological basis of infective syndromes as per the source/risk e.g. Blood borne, sexually transmitted infections congenital, vector borne, food, air & water borne, zoonotic, laboratory acquired, occupational infections etc. Opportunistic Infections in special and high risk host eg Pregnancy, neonates, geriatrics, diabetics, immunocompromised host due to any reason, patients with Implants/Devices, dialysis etc, Infections in special situations/ scenario -Tropical, Travel related, Emerging/ Remerging Infectious diseases seen commonly, agents of bioterrorism etc.

ii. Elicit relevant history, interpret laboratory results with clinic-microbiological correlation and develop diagnostic and treatment algorithms.

Following organisms (bacteria, fungi, virus and parasites) must be covered under clinical/systemic microbiology and the list must be updated to include newly identified microbes from time to time-

Bacteria:

1. Gram positive cocci of medical importance including *Staphylococcus, Micrococcus, Streptococcus, anaerobic cocci* etc.
2. Gram negative cocci of medical importance *including Neisseria, Branhamella, Moraxella* etc.
3. Gram positive bacilli of medical importance including *Lactobacillus, Coryneform organisms, Bacillus and aerobic bacilli, Actinomyces, Nocardia, Actinobacillus and other actinomycetales, Erysipelothrix, Listeria, Clostridium* and other spore bearing anaerobic bacilli etc.
4. Gram negative bacilli of medical importance including *Enterobacteriaceae, Vibrios, Aeromonas, Plesiomonas, Haemophilus, Bordetella, Brucella, Gardnerella, Pseudomonas and other non-fermenters, Pasteurella, Francisella, Bacteroides, Fusobacterium, Leptotrichia and other anaerobic gram negative bacilli* etc.

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5. *Helicobacter, Campylobacter, Calymmatobacterium, Streptobacillus, Spirillum* and miscellaneous bacteria
6. *Mycobacteria*
7. *Spirochaetes*
8. *Chlamydia*
9. *Mycoplasmatales; Mycoplasma, Ureaplasma, Acholeplasma and other Mycoplasmas.*
10. *Rickettsiae, Coxiella, Bartonella* etc.
11. Any newly emerging bacteria

Fungi:

1. Yeasts and yeast like fungi of medical importance including *Candida, Cryptococcus, Malassezia, Trichosporon, Geotrichum, Saccharomyces* etc.
2. Mycelial fungi of medical importance including *Dermatophytes, Aspergillus, Zygomycetes, Pseudallescheria, Fusarium, Piedra, other dematiaceous hyphomycetes and other hyalohyphomycetes* etc.
3. Dimorphic fungi including *Histoplasma, Blastomyces, Coccidioides, Paracoccidioides, Sporothrix, Talaromyces marneffei* etc.
4. Fungi causing Mycetoma, Chromoblatomycosis, Occulomycosis Otomycosis, Phaeohyphomycosis etc
5. *Pythium insidiosum*
6. *Prototheca*
7. *Pneumocystis jirovecii*
8. *Lacazia loboi (Loboa loboi)*
9. Laboratory contaminant fungi
10. Fungi causing Mycetism and mycotoxicosis
11. Any newly emerging fungi

Virus:

1. DNA viruses of medical importance including Pox viruses, Herpes viruses, Adeno viruses, Hepadna virus, Papova and Parvo viruses etc.

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2. RNA viruses of medical importance including Picorna viruses, Toga viruses, Flavi viruses, Orthomyxo viruses, Paramyxo viruses, Reo viruses, Rhabdo viruses, Arena viruses, Bunya viruses, Retro viruses, Filo viruses, Human immunodeficiency virus, Arbo viruses, Corona viruses, Calci viruses etc.
3. Oncogenic viruses
4. Bacteriophages
5. Slow viruses including prions
6. Unclassified viruses
7. Viriods
8. Any newly emerging virus

Parasite:

1. Protozoan parasites of medical importance including *Entamoeba, Free living amoebae, Giardia, Trichomonas, Leishmania, Trypanosoma, Plasmodium, Toxoplasma, Sarcocystis, Cryptosporidium, Cyclospora Isospora, Babesia, Balantidium,* etc.

2. Helminths of medical importance including those belonging to Cestoda (*Diphyllobothrium, Taenia, Echinococcus, Hymenolepis, Dipylidium, Multiceps* etc.), Trematoda (*Schistosomes, Fasciola, Fasciolopsis, Gastrodiscoides, Paragonimus, Clonorchis, Opisthorchis* etc.) and Nematoda (*Ascaris lumbrecoides, Ancylostoma duodenale, Enterobius vermicularis, Trichuris trichiura, Filariasis* etc.)

3. *Rhinosporidium seeberi*

4. Entomology: common arthropods and other vectors viz. mosquito, sand fly, ticks, mite, cyclops, louse, myasis etc.

5. Neglected tropical parasitic diseases

6. Any newly emerging parasite

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Paper IV: Applied Microbiology (AM) & Recent Advances:

Student should be able to apply knowledge & comprehension about following applied aspects:

i. **Prophylaxis** - Basic Principles and applications of general, immune as well as chemo- prophylaxis of infections in various clinical situations / scenarios.

ii. **Vaccinology**: types of vaccines, principles, methods of preparation of vaccines and administration of vaccines.

iii. **Health care associated Infections** - types, pathogenesis, diagnosis, prevention, control and surveillance of health care associated infections.

iv. Biomedical waste and its management.

v. **Role of microbes in non-communicable diseases** - infectious agents in origin and progression of non-communicable diseases like cancer, diabetes, musculoskeletal disorder and influence of these microbes on mental health.

vi. **Antimicrobial Resistance Detection and Prevention:** classification, mechanism of action, detection and reporting drug resistance to antimicrobials (antibacterial, antiviral, antifungal, antimycobacterial and antiparasitic agents).

vii. Investigation of an infectious disease outbreak in hospital and outbreak/epidemic/pandemic in community.

viii. Information technology (computers) in microbiology.

ix. Automation in Microbiology.

x. Molecular techniques in the laboratory diagnosis of infectious diseases.

xi. Statistical analysis of microbiological data and research methodology.

xii. Animal and human ethics involved in microbiological work.

xiii. Laboratory safety and management.

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B. Predominant in Affective Domain

i. Communicate effectively & empathically with patients and their relatives during sample collection, history taking, counseling and reporting results.

ii. Acquire Consent taking and counseling skills and demonstrate these to undergraduates.

iii. Communicate effectively with peers, and consultants for better clinical correlation of laboratory findings as well as research.

iv. Demonstrate effective communication and attitudinal skill while teaching undergraduate students.

v. Function as an effective team member and leader with good conflict management skills.

vi. Adopt ethical principles, particularly maintenance of confidentiality when dealing with laboratory reports.

vii. Demonstrate ability to recognize and manage ethical and professional conflicts and abide by prescribed ethical and legal codes of conduct and practice.

viii. Demonstrate altruistic professional behavior with respect, discipline, responsibility, accountability, punctuality and integrity at all times while dealing with patients and their relatives.

C. Psychomotor Domain: (Skills)

C1. The postgraduate student should be able to *perform the following and/or interpret the results independently or as a part of a team*:

➢ Laboratory skills:

- Collect, transport and store appropriate specimens for microbiological investigations.
- Receive and process clinical specimens after appropriate preparation of samples for the appropriate investigation (centrifugation, extraction, mincing concentration etc.)
- Processing of samples by various methods like:
  - Macroscopic/gross examination of samples.
  - Choose the most appropriate microscopic method for demonstration of pathogens.
  - Prepare, examine, and demonstrate microbes in direct smears for diagnosis of infectious disease/s.
  - Isolate and identify pathogenic microbe from clinical specimens (by conventional & automated methods).
  - Perform, interpret & record antimicrobial susceptibility testing of the isolate.
  - Perform rapid, conventional and automated serological techniques for diagnosis of infectious diseases and immunological diseases.
- Maintain records and ensure quality control in microbiology.

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- Maintain and preserve microbial cultures.
- Operate and maintain instruments used in the laboratory for sterilization and disinfection and patient care with quality control.
- Operate and maintain common laboratory equipment like microscopes, water bath, centrifuge, incubator, automated culture system, micro-centrifuge, ELISA washer and reader etc.
- Perform and assess significance of microbial contamination of food, water and air.
- Biosafety measures - biosafety cabinets, chemical material safety data sheet (MSDS), fire safety, needle stick injury management.

Organisms (Bacteria, Fungi, Virus and Parasites) based Laboratory skills:

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- **Direct microscopic methods for demonstration of infectious agents:**
  a. Wet mount examination for - looking for cells and organisms (bacteria, fungi, parasite)
     i. Saline mount stool sample - parasitic morphology
     ii. Iodine mount-parasitic morphology
     iii. KOH for fungi
     iv. Negative staining
  b. Staining methods
     i. Preparation of stains & quality check
     ii. Preparation of peripheral blood smears from various samples
     iii. Staining techniques - simple, differential, special staining methods - capsule, spore, flagella etc.
     iv. Gram Staining
     v. Acid Fast staining (with modifications).
     vi. Leishman & Giemsa for demonstration of intracellular pathogen bacteria, parasite, fungi etc.
     vii. Albert staining.
  c. Fluorescent staining
     i. Auramine staining - Mycobacterium tuberculosis.

ii. QBC – for malaria.
iii. Calcoflor white staining for fungus

d. Isolation of pathogens
    i. Preparation of glass wares
    ii. Sterilization procedures
    iii. Media preparation-required for isolation & identification
    iv. Quality check of all media - functional as well as sterility check and maintenance of the record
    v. Inoculation methods of various samples – surface, streak, stab etc depending on sample
    vi. Incubation methods - aerobic, anaerobic, microaerophilic, capnophilic depending on the pathogens.

e. Identification of pathogen
    i. Colony characters – various characters to be noted in different media.
    ii. Staining to identify – Gram's / Alberts / Acid Fast/ Lactophenol cotton blue depending on pathogen.
    iii. Motility by hanging drop preparation and other methods.
    iv. Biochemical reactions - phenotypic-enzymatic, oxidative fermentative, sugar fermentation, other special tests helping to identify up to species level.
    v. Serotyping.

f. Antibiotic Susceptibility Testing
    i. Selection of antibiotic disks as per CLSI/EUCAST based on the probable identification of organism - bacteria, fungi.
    ii. Detection of drug resistant strains - MRSA, VISA, VRE, ESBL, MBL, CRE etc.
    iii. Broth microdilution methods for bacteria and fungi.

- **Immunological tests**
    i. i. Collection, preparation and storage of samples
    ii. ii. Perform Rapid tests / /Latex agglutination/ ICT/ELISA etc

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- **Molecular tests**
    i. PCR/RTPCR – all steps till interpretation
    ii. CBNAAT
- **Biomedical waste management skills.**
- **Quality control skills in all areas.**

➢ Clinical Microbiology Skills

(Infectious Disease Case Based Skill)

i. Demonstrate ability to take and interpret the history of infectious disease case.
ii. Be able to clinically examine the case and diagnose.
iii. Take decision for choice of samples to be collected for diagnosis
iv. Suggest optimum choice of antimicrobial agent to be prescribed with reasons.

➢ Infection Prevention and Control Skills-

i. Hand hygiene skills
ii. Donning and doffing of PPE
iii. Transmission based precautions in patient care
iv. Segregation and disposal of biomedical waste in laboratory and hospital
v. Handling of sharps
vi. Post-exposure prophylaxis when exposed to blood and body fluids
vii. Spillage management
viii. Sterilization policy of environment and devices in the hospital as per the latest guidelines.
ix. Calculation of HAI infection rates.
x. Plan & conduct HAI surveillance & infection control audits

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C 2. Should be able to **perform under supervision** and/or interpret the results of *the following desirable procedures independently or as a part of a team*:

- Demonstration of microbe by:

i. IF – autoimmune diseases
ii. IF – antigen demonstration in fungi/viral infection /cellular changes

- Isolation & Identification using newer automated systems for bacterial identification, -Mycobacterial culture and Mycobacterial susceptibility
- Immunological test
    i. Nephelometry/ turbidometry method for quantitative CRP/ASO/RA test
    ii. Chemi-Luminiscence Immuno Assay
- Perform molecular & newer diagnostic tests for diagnosis of infectious disease.

C 3. Should observe the following procedures independently or as a part of a team and/or interpret the results of* : (optional)

- Demonstration of microbes by Electron microscope
- Viral culture & identification of growth of viruses
- Immunological test
    iii. Quantiferon
    iv. Flowcytometry
- Molecular -
    i. Genome Sequencing methods
    ii. Molecular typing.

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Note: If any of the above facilities are not available in the institute effort to collaborate and post the students in nearby laboratory to acquire the skills shall be made.

TEACHING AND LEARNING METHODS

General principles

Acquisition of competencies being the keystone of doctoral medical education, such training should be skills oriented. Learning in the program, essentially autonomous and self-directed, and

emanating from academic and clinical work, shall also include assisted learning. The formal sessions are meant to supplement this core effort.

All students joining the postgraduate (PG) courses shall work as full-time (junior) residents during the period of training, attending not less than 80% of the training activity during the calendar year, and participating in all assignments and facets of the educational process. They shall maintain a logbook for recording the training they have undergone, and details of the procedures done during laboratory and clinical postings in real time.

Teaching-Learning methods

This should include a judicious mix of demonstrations, symposia, journal clubs, clinical meetings, seminars, small group discussion, bed-side teaching, case-based learning, simulation-based teaching, self-directed learning, integrated learning, interdepartmental meetings and any other collaborative activity with the allied departments. Methods with exposure to the applied aspects of the subject relevant to basic/clinical sciences should also be used. **The suggested examples of teaching-learning methods are given below but are not limited to these. The frequency of various below mentioned teaching-learning methods can vary based on the subject's requirements, competencies, work load and overall working schedule in the concerned subject.**

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A. Lectures: Didactic lectures should be used sparingly. A minimum of 10 lectures per year in the concerned PG department is suggested. Topics to be selected as per requirements of the subject. All postgraduate trainees will be required to attend these lectures. Lectures can cover topics such as:

1. Subject related important topics as per specialty requirement
2. Recent advances
3. Research methodology and biostatistics
4. Salient features of Postgraduate medical curriculum
5. Teaching and assessment methodology.

Topic numbers 3, 4 & 5 can be done during research methodology/biostatistics and medical education workshops in the institute.

B. Journal club: Minimum of once in 1-2 weeks is suggested.

Topics will include presentation and critical appraisal of original research papers published in peer reviewed indexed journals. The presenter(s) shall be assessed by faculty and grades recorded in the logbook.

C. Student Seminar: Minimum of once every 1-2 weeks is suggested.

Important topics should be selected as per subject requirements and allotted for in-depth study by a postgraduate student. A teacher should be allocated for each seminar as faculty moderator to help the student prepare the topic well. It should aim at comprehensive evidence-based review of the topic. The student should be graded by the faculty and peers.

D. Student Symposium: Minimum of once every 3 months.

A broad topic of significance should be selected, and each part shall be dealt by one postgraduate student. A teacher moderator should be allocated for each symposium and moderator should track the growth of students. The symposium should aim at an evidence-based exhaustive review of the topic. All participating postgraduates should be graded by the faculty and peers.

E. Laboratory work / Bedside clinics: Minimum- once every 1-2 weeks.

Laboratory work/Clinics/bedside teaching should be coordinated and guided by faculty from the department. Various methods like DOAP (Demonstrate, Observe, Assist, Perform), simulations in skill lab, and case-based discussions etc. are to be used. Faculty from the department where a student is posted should participate in moderating the teaching-learning sessions during clinical rounds.

F. Interdepartmental colloquium

Faculty and students must attend monthly meetings between the main Department and other department/s on topics of current/common interest or clinical cases.

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G. a. Rotational clinical / community / institutional postings (As per Table I)

Depending on local institutional policy and the subject specialty needs, postgraduate trainees may be posted in relevant departments/ units/ institutions. The aim would be to acquire more in-depth knowledge as applicable to the concerned specialty. Postings would be rotated between various units/departments and details to be included in the specialty-based Guidelines. Few examples are listed below:

- Broad specialty departments
- Emergency/Casualty department
- Super specialty departments e.g. Cardiology / Endocrinology / Nephrology / Medical Oncology etc.
- Laboratory-based specialty units/departments e.g. Biochemistry / Microbiology/ Infection control unit/Laboratory Medicine etc.
- Medical Education Unit (MEU) or Department of Medical Education (DOME)

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Clinical / Practical Training Schedule in Microbiology

The three-year training programme in microbiology is arranged in the form of rotational postings to different sections/laboratories/departments/disciplines for specified periods. Providing a suitable learning environment to develop clinical insight and achieve the outcomes of a medical microbiologist must be the driving force while planning posting schedules, which may be modified depending on needs, feasibility and exigencies. Student must be posted for various duration in different sections of Microbiology (like Bacteriology, Serology, Virology, Parasitology, Immunology, Mycobacteriology, Mycology and Hospital infection control), patient care areas in hospital (like emergency, OPDs, critical care areas, surgical and medical wards etc) as well as in community outreach programs, so that they can learn specific requirements of each section and participate in patient care and prevention of infectious diseases in the hospital as well as community. These postings are meant to provide hands-on training and develop required skills in clinical and laboratory medicine of microbiology.

Table 1. Following is the suggested plan of Rotation for Postgraduate students Postings to Diagnostic Laboratories/Hospital/ Community-

Sr no	Schedule of Rotation	Duration	Suggested Specific Learning Objectives
1	Microbiology laboratory i. Different sections of Bacteriology ii. Media preparation iii. Mycobacteriology iv. Serology/Immunology v. Mycology vi. Virology vii. Parasitology viii. Molecular lab **ix.** Hospital Infection Control including BMW management	Distributed in various section depending upon training & departmental needs	• As per the specific objectives in each section, a student is expected to acquire skills from basic to the most recent ones in diagnostic microbiology.
2	Sample Collection area	**Two weeks**	• To learn pre-analytical parameters & procedures at sample collection area.

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			• To communicate effectively with patients at sample collection area. • Learn to demonstrate respect, empathy & confidentiality when dealing with patients, samples and reports. • Demonstrate leadership skills in managing the functioning of the lab (staff management, preparing duty roster)
3	Clinical Pathology i. Hematology ii. Histopathology iii. Blood Bank	**Two weeks**	• Basic knowledge of clinical pathology (as applied to Microbiology) • Inflammation and repair • Intercellular substances and reaction • Pathological changes in the body in bacterial, viral, mycotic and parasitic infections **Clinical Pathology skills**: • Peripheral smear examination • CBC interpretation • Urine examination • Pathological investigations and their significance in infectious disease diagnosis.

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			Blood Bank skills: • Transfusion transmitted infection Blood grouping • Screening of blood & blood donors • Counseling skills **Histopathology skills:** • Various stains and staining techniques used in histopathological examination of infectious agents • Identification of pathogen and/or pathological changes in tissue sections in infectious diseases.
4	Clinical Biochemistry	**One week**	• Basic understanding of biochemistry as applied to immunological/ molecular methods for study of microbial diseases and pathogenesis of infections. • Significance of biochemical markers/profile in diagnosis, prognosis and monitoring of infective syndromes like sepsis
5	ICTC /PPTCT/ART	**Two weeks**	• HIV counseling skills • HIV Testing strategies • HIV Surveillance strategies • Treatment regimens in HIV positive

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			case, management of drug resistance, and prophylaxis PEP, prevention & management of opportunistic infection
6	Tuberculosis and RNTCP	**Two weeks**	• Diagnosis of Pulmonary and extra pulmonary TB • Fluorescent Microscopy for TB • Molecular diagnosis • National tuberculosis Elimination Program • Treatment regimens in susceptible and drug resistant TB cases
7	District hospital postings (mandatory) 3rd or 4th semester for 3 months	**Three months***	• Identify types of infections seen in community • Identify lacuna in KAP in community that promote development of infections • Choice of antimicrobials and treatment plan for infections in community • Infection control in community • Should contribute to strengthen the services of the district health system, the diagnostic laboratory services. • Participate in public health programs & research activities

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8	**Clinical locations –** i. Medicine & allied (General Medicine, Respiratory Disease, Skin & Venereal Disease) ii. Pediatrics iii. Surgery & allied (General Surgery, Orthopedic) iv. Obstetric and Gynecology	**Two months** Posting to be done for morning half of the day	**Depending on the area of posting-** • History taking and physical examination skills • Sample collection and transportation skills • Identification of common infections and make a differential diagnosis • Choose the appropriate laboratory investigations required for confirmation of diagnosis • Interpret the laboratory results and correlate them clinically. • Learn common treatment plan, particularly choice of antimicrobials and identify factors that influence choice of antimicrobials. • Acquire reasoning and critical thinking required in decision making when dealing with an infectious disease case • Infection control practices
9	**Critical care units-** i. Medical ICU	**Three weeks** **(in morn**ing half day)	• All above in a critical setting along with • Availability and choice of specialized investigations necessary for optimum

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	ii. Surgical ICU iii. Neonatal/Pediatric ICU		management of a critical patient with ID. Significance and adherence to antibiotic policy and antibiotic stewardship program Infection control in ICU
10	Institutional Super specialty wing if available Dialysis, Oncology, Cardiology etc	**One week** (morning half day)	• To study infections seen in special situations along with their management & prevention approach
	Total duration of posting outside microbiology laboratory	**33 weeks**	

***Posting under "District Residency Programme"**

Depending upon the objectives to be achieved, feasibility and availability of resources, the rotational postings can be within the hospital or outside the hospital.

During the clinical posting, opportunities to present and discuss infectious disease cases through bedside discussion and ward/grand rounds with clinicians in different hospital setting must be scheduled.

The PG student must be tagged along with the resident of the clinical department for bedside case discussion, under the guidance of an assigned faculty. A minimum of five case histories shall be recorded by a student during course of study. The case history must be representative of different type of Infectious Disease (ID) cases likely to be encountered eg., those caused by different microbes in community and hospital setting, HAI, infections in critical care/ ward

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setting, infection in different age groups, infections in special host like Immunocompromised host, traveler, specific occupations etc.

The process of recording case histories can begin in first half of 2nd year of PG program, after students have learnt about various infective syndromes. The severity and complexity of cases must progress gradually, with simple community-based infection to begin with. At least one fourth of the cases recorded must have been discussed with the ID specialist or a clinician and their feedback/remarks documented in log book/ portfolio with their signatures.

Documentation of students learning at the end of each posting is required.

Emergency duty

The student should also be posted for managing emergency laboratory services in Microbiology. He/she should deal with all emergency investigations in Microbiology.

G b. *Posting under "District Residency Programme" (DRP):

All postgraduate students pursuing MD/MS in broad specialties in all Medical Colleges/Institutions shall undergo a compulsory rotation of three months in District Hospitals/District Health System as a part of the course curriculum, as per the Postgraduate Medical Education (Amendment) Regulations (2020). Such rotation shall take place in the 3rd or 4th or 5th semester of the Postgraduate programme and the rotation shall be termed as "District Residency Programme" and the PG medical student undergoing training shall be termed as "District Resident".

Every posting should have its defined learning objectives. It is recommended that the departments draw up objectives and guidelines for every posting offered in conjunction with the collaborating department/s or unit/s. This will ensure that students acquire expected competencies and are not considered as an additional helping hand for the department / unit in which they are posted. The PG student must be tagged along with those of other relevant departments for bedside case discussion/basic science exercises as needed, under the guidance of an assigned faculty.}

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Opportunities to present and discuss infectious disease cases through bedside discussion and ward/grand rounds with specialists / clinicians in different hospital settings must be scheduled to address antimicrobial resistance issues and strategies to deal with it.

H. Teaching research skills

Writing a thesis should be used for inculcating research knowledge and skills. All postgraduate students shall conduct a research project of sufficient depth to be presented to the University as a postgraduate thesis under the supervision of an eligible faculty member of the department as guide and one or more co-guides who may be from the same or other departments.

In addition to the thesis project, every postgraduate trainee shall participate in at least one additional research project that may be started or already ongoing in the department. It is preferable that this project will be in an area different from the thesis work. For instance, if a clinical research project is taken up as thesis work, the additional project may deal with community/field/laboratory work. Diversity of knowledge and skills can thereby be reinforced.

I. Training in teaching & learning skills

MEU/DOME should train PG students in education methodologies and assessment techniques. The PG students shall conduct UG classes in various courses and a faculty shall observe and provide feedback on the teaching skills of the student.

J. Log book

During the training period, the postgraduate student should maintain a Log Book indicating the duration of the postings/work done in Wards, OPDs, Casualty and other areas of posting. This should indicate the procedures assisted and performed and the teaching sessions attended. The log book entries must be done in real time. The logbook is thus a record of various activities by the student like: (1) Overall participation & performance, (2) attendance, (3) participation in sessions, (4) record of completion of pre-determined activities, and (5) acquisition of selected competencies.

The purpose of the Log Book is to:

a) Help maintain a record of the work done during training.

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b) Enable Faculty/Consultants to have direct information about the work done and intervene, if necessary.

c) Provide feedback and assess the progress of learning with experience gained periodically.

The Log Book should be used in the internal assessment of the student, should be checked and assessed periodically by the faculty members imparting the training. The PG students will be required to produce completed log book in original at the time of final practical examination. It should be signed by the Head of the Department. A proficiency certificate from the Head of Department regarding the clinical competence and skillful performance of procedures by the student will be submitted by the PG student at the time of the examination.

The PG students shall be trained to reflect and record their reflections in logbook particularly of the critical incidents. Components of good teaching practices must be assessed in all academic activity conducted by the PG student and at least two sessions dedicated for assessment of teaching skills must be conducted every year of the PG program. The teaching faculty shall refer to the MCI Logbook Guidelines uploaded on the Website.

K. **Course in Research Methodology**: All postgraduate students shall complete an online course in Research Methodology within six months of the commencement of the batch and generate the online certificate on successful completion of the course.

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Other aspects

- The Postgraduate trainees must participate in the teaching and training program of undergraduate students and interns attending the department.
- Trainees shall attend accredited scientific meetings (CME, symposia, and conferences) at least once a year.
- Department shall encourage e-learning activities.
- The Postgraduate trainees should undergo training in Basic Cardiac Life Support (BCLS) and Advanced Cardiac Life Support (ACLS).
- The Postgraduate trainees must undergo training in information technology and use of computers.

During the training program, patient safety is of paramount importance; therefore, relevant clinical skills are to be learnt initially on the models, later to be performed under supervision followed by independent performance. For this purpose, provision of skills laboratories in medical colleges is mandatory.

Skills & performance

The student should be given graded responsibility to enable learning by apprenticeship. The faculty throughout the year should assess competence of the student in skills. Feedback must be given and area of improvement/remarks should be mentioned for the skill and student should be re-assessed for the skills which are not acquired. To go to the next level, it should be mandatory for the student to acquire lower level skills satisfactorily, i.e only on satisfactory completion of assisted/performed with assistance skills should the student be permitted to perform the skill independently.

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ASSESSMENT

I. FORMATIVE ASSESSMENT, ie., assessment to improve learning

Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self-directed learning and ability to practice in the system.

General Principles

Internal Assessment should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills.

The Internal Assessment should be conducted in theory and practical/clinical examination, should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills. At least five clinical cases shall be assessed through discussion of case histories recorded by the students while posted

in clinical setting and recorded along with feedback (preferably by ID specialist if available /clinician).

Quarterly assessment during the MD training should be based on:

- Case presentation, case work up, case handling/management
- Journal club- Paper presentation & discussion
- Seminar/Lecture/ group discussion
- Case based /Laboratory or Skill based discussions
- Interdepartmental case or seminars, clinical microbiology round/ grand round/ seminar-discussion

Note: These sessions may be organized and recorded as an institutional activity for all postgraduates.

- Attendance at Scientific meetings, CME programmes

The student is to be assessed periodically as per categories listed in the postgraduate student appraisal form (Annexure I1).

II. SUMMATIVE ASSESSMENT, i.e., assessment at the end of training

Essential pre-requisites for appearing for examination include:

1. **Log book** of work done during the training period including rotation postings, departmental presentations, and internal assessment reports should be submitted.

2. At least **two presentations** at national level conference. One research paper should be published / accepted in an indexed journal**. (It is suggested that the local or University Review committee assess the work sent for publication).**

The summative examination would be carried out as per the Rules given in the latest POSTGRADUATE MEDICAL EDUCATION REGULATIONS. The theory examination shall be held in advance before the Clinical and Practical examination, so that the answer books can be assessed and evaluated before the commencement of the clinical/Practical and Oral examination**.**

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The postgraduate examination shall be in three parts**:**

1. **Thesis**

   Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination. The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination. A postgraduate student in broad specialty shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners**.**

2. **Theory examination**

   The examinations shall be organized on the basis of 'Grading 'or 'Marking system' to evaluate and to certify postgraduate student's level of knowledge, skill and competence at the end of the training, as given in the latest POSTGRADUATE MEDICAL EDUCATION REGULATIONS. Obtaining a minimum of **50% marks in 'Theory' as well as 'Practical' separately** shall be mandatory for passing examination as a whole. The examination for M.D shall be held at the end of 3rd academic year.

There shall be four theory papers (as per PG Regulations).

Paper I- General Microbiology and Immunology (GM & IG).

Paper II– Clinical / Systemic Microbiology (CM I).

Paper III– Clinical / Systemic Microbiology (CM II).

Paper IV- Recent Advances & Applied Microbiology (AM).

Universities shall prepare a blueprint for assessment of competencies and ensure 60-70% weightage is given to higher levels in Blooms taxonomy (application and above) in theory with more number of clinical scenario based questions. In **Paper II/III (CM – II/III) –distribution of Clinical Scenarios testing the ability of a student to deal with infections caused by**

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various etiological agents is suggested to be 40-50% Bacterial, 20-30% Viral, 10-20 % each for Mycobacterial, Parasitic & Fungal pathogens.

3. Practical/Clinical and Oral/Viva Voce examination

Practical examination

Practical examination should be spread over two days and include various major components of the syllabus focusing mainly on the psychomotor & affective domain.

Type of Exercises for Practical Examination should include cases (actual or paper based depending on the feasibility) of infectious diseases for workup and evaluation of clinical microbiology competence along with exercises to test ability to perform bacteriology, virology, parasitology, mycology, mycobacteriology, immunology, serology with microscopic examination and antimicrobial susceptibility report,.

Oral/Viva voce examination: The simultaneous viva-voce on the clinical case & lab based practical exercise should be taken along with main viva by each examiner separately. Oral examination shall be comprehensive enough to test the postgraduate student's overall ability to apply knowledge of the subject to hospital/community/research areas focusing on psychomotor and affective domain skills.

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Table 2. Suggested Day wise distribution of practical exercises:

Ex. No	Day -1	Ex. No	Day-2
1	Clinical Microbiology exercise (Give a real clinical case /paper based scenario addressing commonly seen cases in bacteriology/mycobacteriology/vir	1 cont	Clinical Microbiology exercise - Conclusion

	ology/mycology/parasitology/HAI /AMR/out break /national project based etc of infectious diseases to the PG for workup and evaluation with respect to case history, basic physical examination, required investigations, interpretation of diagnostic test results, and therapeutic management decisions including prescription of antibiotics,, along with IG practices)		
2	Long Exercise- Bacteriology (Mixed culture given with a clinical history representing any specimen collected from respective systemic infection)	**2 cont**	Long Exercise - Bacteriology conclusion
3	Short Exercise – Bacteriology (Identification of a pure culture)	**3 cont**	Short Exercise - Bacteriology conclusion
4	Serology Exercise (In a clinical case, choice of test & technique with interpretation of test results)	**4 cont**	Serology cont. if required
5	Virology techniques (In a clinical case, choice of test & technique with interpretation of test results. Viral serology/ Molecular	**5 cont**	Virology cont. if required

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	techniques depending upon availability)		
6	Mycology (Identification of fungi in a clinical case)	**6 cont**	Mycology cont. if required
7	Parasitology (In a clinical case, choice of test & technique with interpretation of test results Stool examination, Examination of Peripheral blood smear etc)	**9**	Pedagogy (10-15minutes)
8	Slides (Slides including histopathology for microscopic identification & discussion	**10**	Log book, Dissertation Viva, Grand-Viva

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Recommended Reading

Books (latest edition)

1. Forbes B, Sahm D, Weissfeld A. *Bailey and Scott's Diagnostic Microbiology*, Mosby, St. Louis.

2. Koneman EW, Allen SD, Janda WM, Schreckenberger PC, Winn WC. *Color Atlas and Textbook of Diagnostic Microbiology*, J.B. Lippincott, Philadelphia.

3. Murray PR, Baron EJ, Pfaller MA, Tenover FC, Yolken RH. *Manual of Clinical Microbiology*, American Society for Microbiology.

4. Garcia LS, Bruckner DA. *Diagnostic Medical Parasitology*, American Society for Microbiology.

5. Mackie & Mccartney Practical Medical Microbiology by J.G. Collee, A.G. Fraser

6. Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases: by John E. Bennett, Raphael Dolin, Martin J. Blaser

7. Manson's Tropical Diseases by Jeremy Farrar; Peter J. Hotez; Thomas Junghanss; Gagandeep Kang; David Lalloo; Nicholas J. Wh

8. Harrison's Infectious Diseases, by Dennis L. Kasper; Anthony S. Fauci

9. Hunter's Tropical Medicine and emerging infectious disease by Edward T. Ryan, David R. Hill, Timothy P. Endy

10. Clinical Immunology Principles and Practices by Robert Rich

11. Anaerobic Bacteriology, Clinical and Laboratory practice by A. Trevorwillis

12. Topley & Wilson, Principles of Bacteriology, Virology and Immunity by M.T. Parker and L.H. Collier

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13. Topley and Wilson's Microbiology and Microbial infection by Brian W. J. Mahy, Graham Selby Wilson, and William Whiteman Carlton Topley

14. Text book of Medical Mycology by Jagadish Chandra

15. Atlas of Fungal infection by Carol A. Kauffman

16. Bennett and Brachman's Hospital Infection, 6th edition, William R Jarvis.

Journals

03-05 international Journals and 02 national (all indexed) journals.

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Annexure I

Following are the competencies to be achieved under Antimicrobial Resistance Detection and Prevention:

1. Demonstrate in depth knowledge of classification, mechanism of action and drug resistance of antimicrobials (antibacterials, antiviral, antifungal, antimycobacterial and antiparasitic agents).
2. Explain various phenotypic and genotypic methods used in laboratory for detection of drug resistant strains and their implications in patient care.
3. Demonstrate skills in performing antimicrobial susceptibility testing with calculations of MIC/MBC by various phenotypic and genotypic methods and interpret results as per standard guidelines (CLSI, EUCAST etc).
4. Detect and report bacterial drug resistance by identification of the commonly isolated drug resistant strains (MRSA, VRSA, VRE, CRE, MBL, AMP-C etc) and choose the most appropriate agent for therapeutic use in a specific clinical scenario.
5. Explain the implications of AST result on antimicrobial therapy to clinicians/colleagues.
6. Communicate effectively with clinicians to guide and create an antimicrobial treatment plan based on organism identification and susceptibility test.
7. Explain the concept of narrow/broad spectrum of antimicrobials, PK/PD parameters and their significance on response to antimicrobial therapy.
8. Explain significance of monitoring of antimicrobial therapy in patient care.
9. Explain the concept of empiric, syndromic and culture-based treatment strategies for treating infections.
10. Explain the need to de-escalate from empirical broad-spectrum therapy to targeted narrow-spectrum therapy.
11. Explain the importance of appropriate use of antimicrobial agents, risk of antimicrobial resistance and spread of AMR in the health care environment and the community.
12. Explain the concept of normal microbial flora, colonization, contamination and infection with its role in deciding antimicrobial therapy.

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13. Demonstrate knowledge about antimicrobial prophylaxis including peri-operative surgical prophylaxis regimens.
14. Describe the concept of first-, second- and third-line antimicrobial therapy for infections.
15. Explain the importance of restricted reporting of susceptibility data by the laboratory to control antimicrobial use.
16. Explain the concept and application of WHO tool for optimizing use of antimicrobial agents: Access, Watch and Reserve (AWaRe).
17. Explain the importance of antimicrobial formularies, consumption data and prescribing policies and processes to monitor use of antimicrobials in hospitals.
18. Effectively use information technology (LIS, WHO NET etc.) for data collection and surveillance of AMR in microbiology laboratory.
19. Explain significance of collecting local antimicrobial resistance data and its use in deciding direct empirical antimicrobial therapy.
20. Demonstrate knowledge and skills to develop antibiotic policy by using local AMR data in hospital.
21. Explain significance of adherence to antibiotic policy and antibiotic stewardship program.
22. Be a part of antimicrobial stewardship team for the institution.
23. Demonstrate knowledge about recent published guidelines that recommend antimicrobial treatment therapy in various clinical situations.
24. Effectively communicate with the patients/ relatives about the role of antimicrobial agents in their disease and advice on appropriate use.
25. Actively engage with patients, relatives and the community to advise on the role of antimicrobial agents in therapy and the threat of resistance.
26. Participate in clinical audit and quality improvement programmes relating to antimicrobial use.
27. Teach students, colleagues and other health professionals regarding antimicrobial use and resistance.

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Annexure II

Student appraisal form for MD in Microbiology

	Elements	Less than Satisfactory			Satisfactory			More than satisfactory			Comments
		1	2	3	4	5	6	7	8	9	
1	**Scholastic aptitude and learning**										
1.1	Has knowledge appropriate for level of training										
1.2	Participation and contribution to learning activity (e.g., Journal Club, Seminars, CME etc)										
1.3	Conduct of research and other scholarly activity assigned(e.g Posters, publications etc)										
1.4	Documentation of acquisition of competence (eg Log book)										
1.5	Performance in work based assessments										
1.6	Self-directed Learning										
2	**Work related to training**										
2.1	Practical skills that are appropriate for the level of training										
2.2	Respect for processes and procedures in the work space										

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2.3	Ability to work with other members of the team										
2.4	Participation and compliance with the quality improvement process at the work environment										
2.5	Ability to record and document work accurately and appropriate for level of training										
3	**Professional attributes**										
3.1	Responsibility and accountability										
3.2	Contribution to growth of learning of the team										
3.3	Conduct that is ethically appropriate and respectful at all times										
4	**Space for additional comments**										
5	**Disposition**										
	Has this assessment pattern been discussed with the trainee?	Yes	No								
	If not explain.										
	Name and Signature of the assesse										
	Name and Signature of the assessor										
	Date										

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Subject Expert Group members for preparation of REVISED Guidelines for competency based postgraduate training programme for MD in Microbiology

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GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR MD IN PULMONARY MEDICINE

Preamble

The purpose of PG education is to create specialists who would provide high quality health care and advance the cause of science through research & training.

Evolution of critical care medicine makes it imperative that the post graduates are trained in the basic principles of Pulmonary Medicine as applied to critical care. The person shall be abreast with the recent advances and developments in the specialty of Pulmonary Medicine. It is expected that the person will develop a spirit of enquiry and get oriented to apply recent advances and medical evidence to the practice of pulmonary medicine. He would also grasp the fundamentals of research methodology. Medical Science is dynamic with a continuous enhancement of knowledge. The process of acquiring knowledge and skills continues even after formal education. The syllabus to be covered during post graduate training in Pulmonary Medicine given below is designed to develop a sound and scientific foundation. It is intended to serve as a guide to impart basic knowledge and develop skills and does not impose any limits to expansion beyond the areas listed.

The purpose of this document is to provide teachers and learners illustrative guidelines to achieve defined outcomes through learning and assessment. This document was prepared by various subject-content specialists. The Reconciliation Board of the Academic Committee has attempted to render uniformity without compromise to purpose and content of the document. Compromise in purity of syntax has been made in order to preserve the purpose and content. This has necessitated retention of “domains of learning” under the heading “competencies”.

SUBJECT SPECIFIC OBJECTIVES

The primary **goal** of the MD course in Pulmonary Medicine is to produce post graduate clinicians able to provide health care in the field of pulmonary medicine. It is expected that a physician qualified in Pulmonary Medicine at the end of the course should be able to diagnose and treat pulmonary diseases, take preventive and curative steps for these diseases in the community at all levels of health care and qualify as a consultant and teacher in the subject.

Each student should obtain proficiency in the following domains during the period of training:

1. Theoretical knowledge of different aspects of Pulmonary Medicine including the status in health and disease.
2. Acquire clinical skills.
3. Acquire practical skills.
4. Management of emergencies including intensive care.
5. Preparation of thesis as per MCI guidelines.

These involve patient management in the outpatient, inpatient and emergency situations, case presentations, didactic lectures, seminars, journal reviews, clinico-patholgical conferences and mortality review meetings and working in the laboratories.

SUBJECT SPECIFIC COMPETENCIES

By the end of the course, the student should have acquired knowledge (cognitive domain), professionalism (affective domain) and skills (psychomotor domain) as given below:

A. Cognitive domain

At the end of the MD course in Pulmonary Medicine, the students should be able to:

1. demonstrate sound knowledge of common pulmonary diseases, their clinical manifestations, including emergent situations and of investigative procedures to confirm their diagnosis. A comprehensive knowledge of epidemiological aspects of pulmonary diseases should be acquired.
2. demonstrate comprehensive knowledge of various modes of therapy used in treatment of pulmonary diseases.
3. describe the mode of action of commonly used drugs, their doses, side-effects / toxicity, indications and contra-indications and interactions.
4. describe commonly used modes of management including medical and surgical procedures available for treatment of various diseases and to offer a comprehensive plan of management inclusive of National tuberculosis Control Programme.
5. manage common pulmonary emergencies and understand the basic of intensive care in patients with pulmonary diseases.
6. practice the field of pulmonary medicine ethically and assiduously, show empathy and adopt a humane approach towards patients and their families.
7. recognize the national priorities in pulmonary medicine and play an important role in the implementation of National Health Programmes including tuberculosis.
8. demonstrate competence in medical management.
9. should inculcate good reading habits and develop ability to search medical literature and develop basic concept of medical research.

B. Affective Domain

1. Should be able to function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the patient and the clinician or other colleagues to provide the best possible diagnosis or opinion.
2. Always adopt ethical principles and maintain proper etiquette in dealings with patients, relatives and other health personnel and to respect the rights of the patient including the right to information and second opinion.
3. Develop communication skills to word reports and professional opinion as well as to interact with patients, relatives, peers and paramedical staff, and for effective teaching.

C. Psychomotor domain

At the end of the course, the student should acquire following clinical skills and be able to:

1. interview the patient, elicit relevant and correct information and describe the history in chronological order.
2. conduct clinical examination, elicit and interpret clinical findings and diagnose common pulmonary disorders and emergencies.
3. perform simple, routine investigative and office procedures required for making the bedside diagnosis, especially sputum collection and examination for etiologic organisms especially Acid Fast Bacilli (AFB), interpretation of the chest x-rays and lung function tests.
4. interpret and manage various blood gases abnormalities in various pulmonary diseases.
5. develop management plans for various pulmonary diseases.
6. assist in the performance of common procedures, like bronchoscopic examination, pleural aspiration and biopsy, pulmonary physiotherapy, endotracheal intubation and pneumo-thoracic drainage / aspiration etc.
7. recognize emergency situations in intensive care, respond to these appropriately and perform basic critical care monitoring and therapeutic procedures.
8. collect, compile, analyse, interpret, discuss and present research data.
9. teach pulmonary medicine to undergraduate and postgraduate students.

To acquire the above skills, the student should be exposed and trained in the following tests and procedures:

1. Diagnostic tests: Performance and interpretation

- Sputum and other body fluids examination with ZN stain for AFB, culture methods for pathogenic bacteria, fungi and viruses
- Newer diagnostic techniques for tuberculosis including molecular techniques
- FNAC of lung masses (blind and image-guided)
- Arterial blood gas analysis and pulse oximetry
- Imaging: Interpretation of plain radiography, ultrasound examination, Computed tomogram, PET scan, MRI
- Sputum cytology
- Simple haematological tests
- Immunological and Serological tests
- Polysomnography (full-night and split-night studies) including CPAP titration; evaluation of daytime sleepiness
- Cardiopulmonary exercise testing
- Pulmonary function tests and interpretation (Spirometry, lung volume, diffusions, body plethysmography, other lung function tests)
- Bronchoprovocation tests
- BCG vaccination
- Mantoux testing; interferon gamma release assays
- Bronchoscopy: fibreoptic/rigid, diagnostic and therapeutic
- ECG, 2D and Doppler echocardiography
- Venous Doppler ultrasound
- Skin tests for hypersensitivity
- Sputum induction and non-invasive monitoring of airway inflammation
- Medical thoracoscopy

2. Therapeutic procedures

- Fine needle aspiration and other guided procedures
- Tube thoracostomy
- Cardiopulmonary rehabilitation exercises
- Postural drainage
- Pleural biopsy, lymph node biopsy
- Administration of inhalation therapy
- Administration of oxygen therapy
- Administration of continuous positive airway pressure (CPAP)/ Bilevel Positive Airway Pressure (BiPAP)
- Monitoring and emergency procedures in intensive care

Syllabus

Course contents:

The student should acquire knowledge in the following:

I. Basic Sciences

A. Anatomy and Histology of Respiratory System

1. Development and Anatomy of Respiratory System
2. Applied embryology of lungs, mediastinum and diaphragm
3. Developmental anomalies

B. Physiology and Biochemistry

1. Assessment of pulmonary functions
2. Control of ventilation; pulmonary mechanics
3. Ventilation, pulmonary blood flow, gas exchange and transport
4. Non-respiratory metabolic functions of lung
5. Principles of electrocardiography
6. Inhalation kinetics and its implication in aerosol therapy, and sputum induction etc.
7. Acid-base and electrolyte balance
8. Physiology of sleep and its disorders
9. Pulmonary innervation and reflexes
10. Pulmonary defence mechanisms
11. Principles of exercise physiology and testing
12. Physiological changes in pregnancy, high altitude, aging
13. Physiological basis of pulmonary symptoms

C. Microbiology

1. Mycobacterium tuberculosis and other mycobacteria
2. Bacteria causing pulmonary diseases
3. Atypical organisms and respiratory tract infections
4. Anaerobes in pleuropulmonary infections
5. Laboratory diagnosis of non-tubercular infections of respiratory tract
6. Laboratory diagnosis of TB including staining, culture and drug sensitivity testing
7. Virulence and pathogenecity of mycobacteria
8. Respiratory viruses: Viral diseases of the respiratory system and diagnostic methods
9. Respiratory fungi: (i) Classification of fungal diseases of lung: candidiasis, Actinomycosis, Nacardiosis, Aspergillosis, Blastomycosis etc. (ii) Laboratory diagnostic procedures in pulmonary mycosis
10. Opportunistic infections in the immuno-ompromised individuals
11. HIV and AIDS. Virological aspects, immuno-pathogenesis, diagnosis

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12. Parasitic lung diseases

D. Pathology

1. Acute and chronic inflammation: Pathogenetic mechanisms in pulmonary diseases
2. Pathology aspects of Tuberculosis
3. Pathology aspects of Pneumonias and bronchopulmonary suppuration
4. Chronic bronchitis and emphysema, asthma, other airway diseases
5. Occupational lung diseases including Pneumoconiosis
6. Interstitial lung diseases including sarcoidosis, connective tissue diseases, pulmonary vasculitis syndromes, pulmonary eosinphilias
7. Tumours of the lung, mediastinum and pleura

E. Epidemiology

1. Epidemiological terms and their definitions
2. Epidemiological methods
3. Epidemiology of tuberculosis, pneumoconiosis, asthma, lung cancer, COPD and other pulmonary diseases
4. National Tuberculosis Control Programme and RNTCP; Epidemiological aspects of BCG
5. Epidemiological aspects of pollution-related pulmonary diseases
6. Research methodology, statistics and study designs

F. Allergy and Immunology

1. Various mechanisms of hypersensitivity reactions seen in pulmonary diseases
2. Diagnostic tests in allergic diseases of lung - *in vitro* and *in vivo* tests, bronchial provocation test
3. Immunology of tuberculosis, Sarcoidosis and other diseases with an immunological basis of pathogenesis

G. Pharmacology

1. Pharmacology of antimicrobial drugs
2. Pharmacology of antitubercular drugs
3. Pharmacology of antineoplastic and immunosuppressant drugs
4. Bronchodilator and anti-inflammatory drugs used in pulmonary diseases
5. Drugs used in viral, fungal and parasitic infections
6. Other drugs pharmacokinetics and drugs interaction of commonly used drugs in pulmonary diseases
7. Pharmacovigilance

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II. Clinical Pulmonary Medicine

Clinical pulmonary medicine covers the entire range of pulmonary diseases. All aspects of pulmonary diseases including epidemiology, aetiopathogenesis, pathology, clinical features, investigations, differential diagnosis and management are to be covered.

A. Infections

1. Tuberculosis

1. Aetiopathogenesis
2. Diagnostic methods
3. Differential diagnosis
4. Management of pulmonary tuberculosis; RNTCP, DOTS, and DOTS-Plus; International Standards of TB Care
5. Complications in tuberculosis
6. Tuberculosis in children
7. Geriatric tuberculosis
8. Pleural and pericardial effusion and empyema
9. Mycobacteria other than tuberculosis
10. Extrapulmonary tuberculosis
11. HIV and TB; interactions of antitubercular drugs with antiretrovirals
12. Diabetes mellitus and tuberculosis
13. Management of MDR and XDR tuberculosis

2. Non-tuberculous infections of the lungs

- Approach to a patient with pulmonary infection
- Community-acquired pneumonia
- Hospital-associated pneumonia, ventilator-associated pneumonia
- Unusual and atypical pneumonias including bacterial, viral, fungal and parasitic and ricketsial, anerobic
- Bronchiectasis, lung abscess and other pulmonary suppurations
- Acquired immunodeficiency syndrome and opportunistic infections in immuno-compromised host
- Principles governing use of antibiotics in pulmonary infections
- Other pneumonias and parasitic infections, Zoonosis

B. Non-infectious Lung Diseases

3. Immunological disorders

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- Immune defence mechanisms of the lung
- Sarcoidosis
- Hypersensitivity pneumonitis and lung involvement
- Eosinophilic pneumonias and tropical eosinophilia
- Pulmonary vasculitides
- Connective tissue diseases involving the respiratory system
- Interstitial lung disease of other etiologies
- Reactions of the interstitial space to injury, drugs
- Occupational and environmental pulmonary diseases

4. Other non-infectious disorders of the lungs and airways

- Aspiration and inhalational (non-occupational) diseases of the lung
- Drug induced pulmonary diseases
- Bullous lung disease
- Uncommon pulmonary diseases (metabolic, immunological, unknown etiology), pulmonary haemorrhagic syndromes
- Other pulmonary diseases of unknown etiology including PLCH, LAM, PAP, alveolar microlithiasis
- Cystic fibrosis and disorders of ciliary motility
- Obesity-related pulmonary disorders
- Upper airways obstruction syndromes
- Occupational lung diseases and pneumoconiosis
- Air-pollution induced diseases, toxic lung and other inhalational injuries
- Health hazards of smoking
- Drug-induced lung diseases

5. Pulmonary Circulatory disorders

- Pulmonary hypertension and cor pulmonale
- Pulmonary edema
- Pulmonary thromboembolic diseases and infarction
- Cardiac problems in a pulmonary patient and pulmonary complications produced by cardiac diseases

6. Obstructive diseases of the lungs

- Asthma including allergic bronchopulmonary aspergillosis, specific allergen immunotherapy and immunomodulation
- Chronic obstructive lung disease and diseases of small airways

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- Special aspects of management including Long term oxygen therapy, Inhalation therapy and Pulmonary rehabilitation

7. Tumors of the lungs

- Comprehensive knowledge of neoplastic and non-neoplastic diseases of lung including epidemiology, natural history, staging, and principles of treatment (medical, surgical, and radiation)
- Solitary pulmonary nodule

8. Diseases of the mediastinum

- Non-neoplastic disorders
- Benign and malignant (primary and secondary) neoplasms and cysts

9. Disorders of the pleura

- Pleural dynamics and effusions
- Non-neoplastic and neoplastic pleural diseases
- Pneumothorax
- Pyothorax and broncho-pleural fistula
- Fibrothorax

10. Critical Care Pulmonary Medicine

- Management of emergency problems of different pulmonary diseases
- Adult respiratory distress syndrome
- Respiratory failure in the patient with obstructive airway disease
- Respiratory failure in other pulmonary diseases
- Management of sepsis
- Respiratory and haemodynamic monitoring in acute respiratory failure
- Non-invasive and Mechanical ventilation
- Principles of critical care, diagnosis and management of complications; severity of illness scoring systems
- Ethical and end-of-life issues in critical care

11. Extrapulmonary manifestations of pulmonary diseases

12. Sleep-related pulmonary diseases

- Polysomnography
- Sleep apneas

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- Other sleep-disordered breathing syndromes

13. Miscellaneous aspects

- Diseases of the diaphragm
- Disorders of chest wall
- Obesity-related pulmonary disorders
- Oxygen therapy
- End-of-life care
- Aerospace Medicine
- Pulmonary problems related to special environments (high altitude, diving, miners)
- Assessment of quality of life using questionnaires
- Health impacts of global warming

14. Preventive Pulmonology

- Principles of smoking cessation and smoking cessation strategies
- Cardiopulmonary rehabilitation
- Preventive aspects of pulmonary diseases
- Vaccination in pulmonary diseases

III. Surgical aspects of Pulmonary Medicine

- Pre- and post-operative evaluation and management of thoracic surgical patients
- Chest trauma/trauma related lung dysfunction
- Lung transplantation

TEACHING AND LEARNING METHODS

Postgraduate teaching programme

General principles

Acquisition of practical competencies being the keystone of PG medical education, PG training should be skills oriented. Learning in PG program should be essentially self-directed and primarily emanating from clinical and academic work. The formal sessions are merely meant to supplement this core effort.

Teaching methodology

This should include regular bedside case presentations and demonstrations, didactic lectures, seminars, journal clubs, clinical meetings, and combined conferences with allied

departments. The post graduate student should be given the responsibility of managing and caring for patients in a gradual manner under supervision.

Formal teaching sessions

In addition to bedside teaching rounds, at least 5-hr of formal teaching per week are necessary. The departments may select a mix of the sessions, as given under formative assessment. Further, the student should:

- Attend accredited scientific meetings (CME, symposia, and conferences).
- Attend additional sessions on resuscitation, basic sciences, biostatistics, research methodology, teaching methodology, hospital waste management, health economics, medical ethics and legal issues related to medical practice are suggested.
- There should be a training program on Research methodology for existing faculty to build capacity to guide research.
- The postgraduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.
- A postgraduate student of a postgraduate degree course in broad specialities/super specialities would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.
- **Log book:** During the training period, the post graduate student should maintain a Log Book indicating the duration of the postings/work done in Wards, OPDs and Casualty. This should indicate the procedures assisted and performed, and the teaching sessions attended. The Log book shall be checked and assessed periodically by the faculty members imparting the training.
- Department should encourage e-learning activities.

Thesis

All MD (Pulmonary Medicine) post graduate students should carry out work on an assigned topic under the direct guidance of a recognised post graduate teacher. A written protocol of the proposed work should be submitted before the end of the first 6 months. Subsequently, the post graduate student should carry out the proposed work for at least 1 year (not inclusive of the period for submitting the protocol and writing-up the final thesis).

During the training programme, patient safety is of paramount importance; therefore, skills are to be learnt initially on the models, later to be performed under supervision followed by performing independently. For this purpose, provision of skills laboratories in medical colleges is mandatory.

ASSESSMENT

FORMATIVE ASSESSMENT, ie., assessment during training

Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self directed learning and ability to practice in the system.

General Principles

Internal Assessment should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills. The Internal Assessment should be conducted in theory and practical/clinical examination.

Quarterly assessment during the MD training should be based on:

1. **Journal based / recent advances learning**
2. **Patient based /Laboratory or Skill based learning**
3. **Self directed learning and teaching**
4. **Departmental and interdepartmental learning activity**
5. **External and Outreach Activities / CMEs**

The student to be assessed periodically as per categories listed in postgraduate student appraisal form (Annexure I).

SUMMATIVE ASSESSMENT, ie., assessment at the end of training

The summative examination would be carried out as per the Rules given in POSTGRADUATE MEDICAL EDUCATION REGULATIONS, 2000.

The Post Graduate Examination shall be in three parts:

1. Thesis:

Every post graduate student shall carry out work on an assigned research project under the guidance of a recognised Post Graduate Teacher, the result of which shall be written up and submitted in the form of a Thesis. Work for writing the Thesis is aimed at contributing to the development of a spirit of enquiry, besides exposing the post graduate student to the techniques of research, critical analysis, acquaintance with the latest advances in medical science and the manner of identifying and consulting available literature.

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Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination. The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination. A post graduate student shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners.

2. Theory Examination:

The examinations shall be organised on the basis of 'Grading'or 'Marking system' to evaluate and to certify post graduate student's level of knowledge, skill and competence at the end of the training. Obtaining a minimum of 50% marks in 'Theory' as well as 'Practical' separately shall be mandatory for passing examination as a whole. The examination for M.D./ MS shall be held at the end of 3rd academic year. An academic term shall mean six month's training period**.**

There shall be four theory papers:

Paper I: General pulmonary medicine and basic sciences;
Paper II: Clinical pulmonary medicine including medical emergencies;
Paper III: Clinical pulmonary medicine including critical care medicine;
Paper IV: Recent advances in pulmonary medicine, and research methodology.

The final qualifying examination should include an assessment of clinical skills in the form of case presentations and discussions. Other rules laid down by the MCI regarding M.D. examinations shall apply here as well.

3. Practical/Clinical and Oral/viva voce Examination:

The post graduate students shall examine a minimum of one long and two short cases.

Oral/viva voce Examination

The oral examination shall be thorough and shall aim at assessing the knowledge and competence of the post graduate student on the subject, investigative procedures, therapeutic technique and other aspects of the specialty which form a part of the examination.

Recommended reading:

Books (latest edition)

1. Harrison's Principles of Internal Medicine ed. Petersdorf (McGraw Hill)
2. Cecil Text book of Medicine ed. Wyngaarden
3. Crofton & Douglas Respiratory diseases ed. Seaton et al (Oxford)
4. Pulmonary diseases & disorders by Fishman (McGraw Hill)
5. Textbook on Pulmonary disease by Fraser & Pare

6.	Asthma	by Clarke et al
7.	Bronchoscopy	by Straddling
8.	Tuberculosis	by SK Sharma
9.	Lung diseases in the Tropics	ed. OP Sharma (Marcel Dekker)
10.	The Normal Lung	by Murray (Saunders)
11.	Pulmonary Function Testing	by Clausen (Academic Press)
12.	Respiratory Physiology	by J.B. West (Williams & Wilkins)
13.	Physiology of Respiration	by J.H. Comroe (Yearbook Med Pub.)
14.	Respiratory Function in disease	by Bates et al (Saunders)

Journals

03-05 international Journals and 02 national (all indexed) journals

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Annexure I

Postgraduate Students Appraisal Form
Pre / Para /Clinical Disciplines

Name of the Department/Unit :

Name of the PG Student :

Period of Training : FROM……TO……

Sr. No.	PARTICULARS	Not Satisfactory	Satisfactory	More Than Satisfactory	Remarks
		1 2 3	4 5 6	7 8 9	
1.	Journal based / recent advances learning				
2.	Patient based /Laboratory or Skill based learning				
3.	Self directed learning and teaching				
4.	Departmental and interdepartmental learning activity				
5.	External and Outreach Activities / CMEs				
6.	Thesis / Research work				
7.	Log Book Maintenance				

Publications **Yes/ No**

Remarks*_____
_____
_____
_____

***REMARKS: Any significant positive or negative attributes of a postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.**

SIGNATURE OF ASSESSEE **SIGNATURE OF CONSULTANT** **SIGNATURE OF HOD**

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