CHAPTER 1

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.

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 internship 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 organized 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.

**OBJECTIVE OF MEDICAL GRADUATE TRAINING PROGRAMME**

**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.
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.

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) (Appendix A)
   ii) Sanitation and water supply
   iii) Prevention and control of communicable and non-communicable diseases
   iv) Immunization
   v) Health Education

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

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 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, MIGRATION AND TRAINING

ADMISSION TO THE MEDICAL COURSE – Eligibility Criteria: No Candidates shall be allowed to be admitted to the Medical Curriculum 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 admission to the MBBS course.
2. He/She has passed qualifying examination as under:

a) Candidates passing the examination in piece-meal (compartmental) are not eligible for admission.

b) 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 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

a) 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

b) 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 and Biology and also English as a compulsory subject.

or

c) The first year of the three years degree course of a recognized university, with Physics, chemistry and Biology 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

d) 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

e) 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.

3. The percentage of NRI students to be admitted for MBBS shall not exceed 15% of total intake.

The following guidelines shall be followed for admission to NRI students

i) Admission to the NRI seats may be made on the basis of the marks in the qualifying examination.

ii) NRI financially supporting the candidate must be a blood relation such as Father/Mother/Brother/Sister/Uncle/Aunty only.

iii) Applicants for admission under NRI Quota shall not have completed 21 years of age as on the 1st of July of the respective academic year.

iv) Candidate must furnish the Xerox copies of the following supporting documents:-

   a) NRI Status Certificate of the financial supporter issued by the Embassy of respective Country under their seal.

   b) NRI Bank Account Pass Book of the financial supporter

   c) Passport of the Financial Supporter

   d) Nativity Certificate of the Financial Supporter

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.

SELECTION OF STUDENTS:

The selection of students to medical college shall be based solely on merit of the candidate.

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. 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 of the basis of Competitive entrance examination a candidate must have passed in the subjects of Physics, Chemistry, Biology and English individually and must have obtained a minimum of 50% of 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 then 50% marks in Physics, Chemistry and Biology competitive examination. In respect of candidates belonging to Schedule Caste, Schedule Tribes or Other Backward Class 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.

**MIGRATION:**

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.

2. Migration of students from one college to another is permissible only if both the colleges are recognized 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 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 one month of passing (declaration of results of the first professional MBBS Examination) along with 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.

5. A student who has joined another college on migration shall be eligible to appear in the 2nd 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.

**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 examination and followed by one year compulsory rotating internship. Each semester will consist of approximately 120 teaching days of 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, Biochemistry 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 and Biochemistry 1/3)

   b) **Phase-II** (3 semester) – 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 these 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 and 2/3 Community Medicine) See Appendix C.

   c) **Phase-III** (Continuation of study of clinical subjects for seven semesters after passing Phase-1)

   The clinical subjects to be taught during Phase II and 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 Medicine and its allied specialties training will include General Medicine, Pediatrics, 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, Orthopedics Surgery including Physiotherapy and Rehabilitation, Ophthalmology, Otorhinolaryngology, Anesthesia, Dentistry, Radio-therapy etc. The Obstetrics & Gynecology training will include family medicine, family welfare planning etc.

3. The first 2 semester (approximately 240 teaching days) shall be occupied in the Phase 1 (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 1 (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.

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 and clinical subjects, along with clinical posting. 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 practical, clinical 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.

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.

8. Maximal duration permitted to complete MBBS Course is 8 years. An extension of 3½ years only is allowed beyond the scheduled time for that batch of MBBS in which the candidate was enrolled.

9. In case of a candidate discontinuing in the middle and wishing to rejoin, the period of absence will be condoned only if a prior permission has been sought from the University before discontinuing.

10. Beyond this stipulated period, Mercy chance for any candidate due to prolonged illness, family problem, natural calamities, etc. will be made only by the Vice-Chancellor of the University.

Subjects covered during different Phases of MBBS
(Detailed syllabus is given separately)

**Phase I (Pre-Clinical subjects)**

1. Human Anatomy  
2. Human Physiology  
3. Biochemistry  
4. Introduction to Humanities and Community Medicine

**Phase II (Para-Clinical subjects)**

1. Pathology  
2. Microbiology  
3. Pharmacology  
4. Forensic Medicine including Toxicology  
5. Community Medicine

**Phase II & III (Clinical subjects)**

1. Medicine and its allied specialities  
a) Medicine  
b) Paediatrics  
c) Psychiatry  
d) Dermatology & STD  
e) Tuberculosis and Respiratory diseases  
2. Surgery and its allied specialities  
a) Surgery  
b) Orthopaedics  
c) Radiodiagnosis and Radiotherapy  
d) Oto-Rhino-Laryngology  
e) Ophthalmology  
3. Obstetrics & Gynaecology  
4. Family Planning (Training in Family Planning should be emphasized in all the three phases and during internship)  
5. Community Medicine  
6. 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.)
Phase Distribution and Timing of Examinations:

<table>
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<tr>
<th></th>
<th>6 Months</th>
<th>6 Months</th>
<th>6 Months</th>
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<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>4</td>
<td>6</td>
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<td>3</td>
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<td>6</td>
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<tr>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
</tr>
</tbody>
</table>

1st professional Examination (during Second semester)
IInd Professional examination (during fifth semester)
IIIrd professional Part I (during 7th semester)
IIIrd professional Part II (Final professional during 9th semester)

Note:

a) Passing in 1st Professional is compulsory before proceeding to Phase II training.
b) A student who fails in the 2nd professional examination, shall not be allowed to appear in 3rd Professional Part I examination unless he passes all subjects of 2nd Professional examination.
c) A student shall not be allowed to appear for 3rd Professional (Part II) examination unless he passes all subjects of 3rd Professional Part I Examination, but can undergo training in 8th and 9th semesters.
d) The student is expected to complete the course within 8 years after which he will not be allowed to appear for any examination.

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

<table>
<thead>
<tr>
<th>Subjects</th>
<th>3rd Semester (Wks)</th>
<th>4th Semester (Wks)</th>
<th>5th Semester (Wks)</th>
<th>6th Semester (Wks)</th>
<th>7th Semester (Wks)</th>
<th>8th Semester (Wks)</th>
<th>9th Semester (Wks)</th>
<th>Total (Wks)</th>
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<tbody>
<tr>
<td>General Medicine ***</td>
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<td>4</td>
<td>6</td>
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<td>26</td>
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<td>Paediatrics</td>
<td>-</td>
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<td>2</td>
<td>2</td>
<td>4</td>
<td>4</td>
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<td>10</td>
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<tr>
<td>Tuberculosis And Chest Diseases</td>
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<td>-</td>
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<td>-</td>
<td>02</td>
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<tr>
<td>Skin &amp; STD</td>
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<td>2</td>
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<td>2</td>
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<td>2</td>
<td>-</td>
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<td>Psychiatry</td>
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<td>2</td>
<td>-</td>
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<td>-</td>
<td>2</td>
<td>-</td>
<td>-</td>
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<td>General Surgery***</td>
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<td>Orthopaedics**</td>
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<td>4</td>
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<tr>
<td>Ear Nose And Throat</td>
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<td>2</td>
<td>08</td>
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<tr>
<td>Obstetrics and Gynaecology**** including Family Planning</td>
<td>2</td>
<td>4</td>
<td>4</td>
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<td>Community Medicine</td>
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<tr>
<td>Total (in Weeks)</td>
<td>18</td>
<td>22</td>
<td>18</td>
<td>22</td>
<td>18</td>
<td>22</td>
<td>22</td>
<td>142</td>
</tr>
</tbody>
</table>

- 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.
ANATOMY
CHAPTER III
CURRICULUM (SUBJECT-WISE)

PHASE I
PRE-CLINICAL SUBJECTS

In the teaching of these subjects stress shall be laid on basic principles of the subjects with more emphasis on their applied aspects.

ANATOMY

The subject of anatomy is taught under the following heads:
1. Gross anatomy
2. Microanatomy
3. Embryology and Genetics
4. Neuroanatomy

Total number of teaching hours is approximately 712 hrs.
Distribution of teaching hours for theory and practicals are as follows:

<table>
<thead>
<tr>
<th>Subject</th>
<th>Approximate No. of hours taught</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. General Anatomy</td>
<td></td>
</tr>
<tr>
<td>Lecture</td>
<td>11 hrs</td>
</tr>
<tr>
<td>Demonstration</td>
<td>22 hrs</td>
</tr>
<tr>
<td>2. Upper Limb</td>
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<tr>
<td>Lecture</td>
<td>16 hrs</td>
</tr>
<tr>
<td>Demonstration</td>
<td>10 hrs</td>
</tr>
<tr>
<td>Dissection</td>
<td>40 hrs</td>
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<tr>
<td>3. Lower Limb</td>
<td></td>
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<tr>
<td>Lecture</td>
<td>16 hrs</td>
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<tr>
<td>Demonstration</td>
<td>10 hrs</td>
</tr>
<tr>
<td>Dissection</td>
<td>40 hrs</td>
</tr>
<tr>
<td>4. Thorax</td>
<td></td>
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<tr>
<td>Lecture</td>
<td>15 hrs</td>
</tr>
<tr>
<td>Demonstration</td>
<td>12 hrs</td>
</tr>
<tr>
<td>Dissection</td>
<td>30 hrs</td>
</tr>
<tr>
<td>5. Abdomen, Pelvis, Perineum</td>
<td></td>
</tr>
<tr>
<td>Lecture</td>
<td>35 hrs</td>
</tr>
<tr>
<td>Demonstration</td>
<td>24 hrs</td>
</tr>
<tr>
<td>Dissection</td>
<td>50 hrs</td>
</tr>
<tr>
<td>6. Head &amp; Neck</td>
<td></td>
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<tr>
<td>Lecture</td>
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<tr>
<td>Demonstration</td>
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<tr>
<td>Dissection</td>
<td>50 hrs</td>
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<tr>
<td>7. Neuroanatomy</td>
<td></td>
</tr>
<tr>
<td>Lecture</td>
<td>12 hrs</td>
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<tr>
<td>Demonstration/Dissection</td>
<td>40 hrs</td>
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<tr>
<td>8. Microanatomy</td>
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<tr>
<td>Lecture</td>
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<td>Practical</td>
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<td>9. Embryology</td>
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<td>10. Genetics</td>
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### DEPARTMENTAL OBJECTIVES

The MBBS students, at the end of the course in Anatomy, should be able to:

1. Point out and state the gross anatomical features of various structures and organs of the human body.
2. Recognize and state the histological features of various tissues and organs of the human body with functional correlation.
3. State the development of various structures of the human body, differentiate abnormal development and interpret the formation of various congenital anomalies.
4. State the basic principles of genetics and understand the basis of genetic disorders.
5. Point out the features of various appearances of the normal human body in skiagrams after routine radiological investigations.
6. Outline the internal structures in relation to the external or surface features of the body.
7. State the features of normal postnatal growth and recognize any variation.
8. Apply the basic knowledge of anatomy in the practice of medical sciences and demonstrate an interest in continuing to learn advances in anatomy and apply the same in medical practice.
9. Stain a paraffin section of any tissue or organ with hematoxylin and eosin and interpret the observations.
10. Embalm and preserve the dead body.
11. Identify the prominent anatomical structures in the living human being and draw inferences for the purpose of anatomical diagnosis of the disease.
 COURSE CONTENT

I. GROSS ANATOMY

I(a) OSTEOLOGY
Must know:
- Names of the bones of the body and their position;
- Classification of the bones with examples;
- General features of the bone;
- Types of ossification and normal development;
- Microscopic anatomy of bone;
- General pattern of blood supply;
- Ossification of the bones of limbs.

I(b) MUSCULAR SYSTEM
Must know:
- Classification and identification of the muscles of the body (except muscles of the vertebral column)
- Main attachments, nerve supply and action;
- Microscopic anatomy of muscles and the nerve terminations.

Desirable to know:
- Details of attachment of the muscles;
- Ultra structural features of muscles;
- Mechanism of the movement caused by the muscle/muscles, various forces exerted by them.

I(c) ARTHROLOGY
Must know:
- Classification of joints,
- General features of different types of joints;
- Detailed study of major joints of the limbs and movements.

Desirable to know:
- Microscopic anatomy of articular cartilage;
- Maintenance of articular cartilages;
- Blood supply to nerve terminals in the articular cartilage.

I(d) CARDIO-VASCULAR SYSTEM
Must know:
- Position, parts of the heart;
- Names of the blood vessels and their distribution in the body;
- Normal development of heart and major blood vessels of the body.

Desirable to know:
- Developmental anomalies;
- Valvular defects and their effects;
- Pathogenesis of the anomalies.

I(e) RESPIRATORY SYSTEM AND THEОРГANS
Must know:
- Position, parts, relations,
- Blood supply,
- Microscopic anatomy,
- Blood air barrier,
- Normal development.

I(f) DIGESTIVE SYSTEM AND THE ORGANS
Must know:
- Position, parts, relations,
Blood supply, nerve supply,
Normal development,
Microscopic anatomy;
Sphincters of gastrointestinal system.

Digestive system (GIT):
General organization, oral cavity, lip, cheek, tongue, taste buds, associated salivary glands. Layers of tubular digestive tract, esophagus, stomach, small intestine, gastro esophageal junction, gastro duodenal junction, large intestine, anal canal and rectoanal junction. Liver, internal organization of liver, liver lobule, liver acinus, significance of zonation in liver acinus, liver sinusoids, detailed structure of hepatocyte, bile canaliculi, bile ducts, gall bladder, bile duct and pancreas.

I (g) GENITO-URINARY SYSTEM AND THE ORGANS
Must know:
- Parts, position, relations,
- Blood supply nerve supply,
- Normal development,
- Microscopic anatomy;
- Electron microscopy of renal glomerulus.

I (h) ENDOCRINE SYSTEM AND INDIVIDUAL ENDOCRINE GLANDS
Must know:
- Parts, location, relations,
- Blood supply, nerve supply,
- Microscopic anatomy;
- Normal development.

I (i) NERVOUS SYSTEM AND ITS COMPONENTS
Must know:
- Meninges, Dural reflections & venous sinuses, Subarachnoid cisterns,
- Parts of Brain and Spinal cord
- Spinal cord - Tracts, position, functions and applied significance
- Brain stem – Nuclei, Tracts, position, connections and applied significance
- Cerebellum - Nuclei, Tracts, position, connections and applied significance
- Cerebrum – Functional areas, Blood supply
  - White mater of cerebrum
  - Basal ganglia – Nuclei, connections, blood supply applied significance
  - Diencephalons – Nuclei, connections, blood supply applied significance
- CSF formation, drainage & applied significance
- Ventricles,
- Limbic system.

Desirable to know:
- Reticular formation,
- Correlation of microscopic anatomy function,
- Development anomalies.

3. SPECIAL SENSORY ORGANS
Must know:
- Gross Anatomy and Micro Anatomy of eyeball, ear, nose, skin and tongue.

Desirable to know:
- Anatomy of the various nerve tracts and pathways concerned with these five sensory organs.
4. LYMPHATIC SYSTEM
Must know:
- Gross anatomy of the different groups of the lymph nodes of the body and structures drained by each group.
- Gross anatomy of the major lymphatics specially about thoracic duct and its tributaries.

I (a) RADIOLOGICAL ANATOMY
Must know:
- Identification of normal anatomical features in skiagrams.
Desirable to know:
- Identification of the normal anatomical features in special investigations.

I (b) SECTIONAL ANATOMY
Must know:
- Anatomical features at the following vertebral levels
  - Transverse section: Cervical 5 & 7,
  - Thoracic 2, 4, 7, 10, 12,
  - Lumbar 1, 3 & 5,
  - Sacral 3.

Desirable to know:
- Median sagittal of head, section of head and neck;
- Median sagittal section of brain;
- horizontal section of brain at the level of 4th ventricle foramen;
- Coronal section of cerebrum at the level of the central sulcus and splenium.

I (c) SURFACE ANATOMY
Must know:
- Study of the surface features of the body
- Projection of the outline of heart,
- Lungs, pleura and important blood vessels and nerves.

Desirable to know:
- Location of the various arterial pulses in the living.

II. EMBRYOLOGY

GENERAL EMBRYOLOGY
Must know:
- Definition of embryology;
- Gestation period: subdivisions;
- Definition of gonads; testis, ovary;
- Definition of gamete: sperm, ovum;
- Definition of gametogenesis;
- Migration of primordial germ cells into indefinite gonad;
- Spermatogenesis; structure of sperm;
- Oogenesis; structure of ovum; growth of follicles.

Desirable to know:
- Sperm in the male genital tract;
- Sperm in the female genital tract;
- Activation and capacitation of sperm ovum in the female genital tract;
- Events of uterine and ovarian cycles.

First Week of Development
Must know:
- Definition, process of fertilization – approximation,
- Contact and fusion of gametes (sperm and ovum);
- Formation of zygote;
- Cleavage division;
- Formation of morula;
- Formation of blastocyst;
- Site of implantation;
- Formation of decidua - its subdivisions.

Desirable to know:
- Result of fertilization;
- Fate of endometrium;
- Preimplantation changes of endometrium;
- In vitro fertilization;
- Types of implantation;
- Abnormal sites of implantation.

Second Week of Development
Must know:
- Differentiation of embryoblast and trophoblast;
- Changes in the embryoblast – bilaminar germ disc;
- Changes in the trophoblast;
- Formations of cytotrophoblast, Syncytiotrophoblast,
- Amniotic membrane, yolk sac,
- Extra embryonic mesoderm and extra embryonic coelom and connecting stalk,
- Formation of chorion,
- Amniotic cavity, primary yolk sac cavity;
- Appearance of prochordal plate.

Third Week of Development
Must know:
- Appearance of primitive streak and primitive node;
- Formation of intraembryonic mesoderm resulting in a trilaminar germ disc;
- Formation of notochord;
- Formation of buccopharyngeal and cloacal membranes;
- Formation of pericardial bar; formation of paraxial, intermediate and lateral plate mesoderm and formation of secondary yolk sac
- Intraembryonic coelom;
- Formation of allantoic diverticulum;
- Derivatives of ectoderm, endoderm and mesoderm.

Desirable to know:
- Formation of neurenteric canal.

Fourth to Eighth Week of Development
Must know:
- Formation of somites;
- Formation of neural tubes;
- Cephalocaudal folding; lateral foldings;
- Formation of a cylindrical body,
- Stomadeum, proctodeum, gut and vitelline duct;
- Subdivision of gut into foregut, midgut and hindgut.

Desirable to know:
- Reversal of structures,
- Ducts, head fold and tail fold;
- Changes in external body form to human appearance.
Third to Tenth Month of Development

Must know:
- Maturation of tissues and organs and rapid growth of body.

Desirable to know:
- Estimation of age; horizons of development.

Placenta

Must know:
- Formation of placenta, decidua basalis;
- Formation of chorionic villi;
- Formation of chorion frondosum;
- Formation of chorion laeve;
- Features of placenta;
- Placental circulation;
- Functions of placenta.

Desirable to know:
- Abnormalities;
- Placenta barrier;
- Ultrastructural features;
- Types of placenta.

Umbilical Cord

Must know:
- Formation of umbilical cord; features of umbilical cord.

Desirable to know:
- Abnormalities.

Amniotic Cavity

Must know:
- Amniotic cavity and membrane;
- Amniotic fluid – functions;
- Expansions of amniotic cavity and fusion with chorion;
- Chorion laeve with decidua capsularis;
- Decidua capsularis with parietalis;
- Obliteration of chorionic and uterine cavities;
- Function of fused foetal membranes to dilate cervical canal.

Desirable to know:
- Abnormalities;
- Obliteration of chorionic and uterine cavities;
- Abnormalities of chorion.

Must know:
- Formation of twins: types

Desirable to know:
- Arrangement of foetal membranes, Conjoined twins.

Teratology

Must know:
- Genetical and environment factors for congenital malformations.

Desirable to know:
- Mode of actions of teratogens, critical periods.

SYSTEMIC EMBRYOLOGY

Must know:
- Normal development of each system.

Desirable to know:
- Developmental abnormalities; pathogenesis of the anomalies.
- Development of the individual organs of digestive system,
- Genital system,
- Urinary system,
- Respiratory system,
- Cardiovascular system,
- Nervous system and special sensory organ and endocrine glands and mammary gland.

Desirable to know:
- Development of skeletal system,
- Muscular system and derivatives of coelomic cavities.

Must know:
- Formation of the congenital anomalies of various organs.

Desirable to know:
- Pathogenesis of the anomalies.

Must know:
- Development of face and the pharyngeal arches
- Associated congenital anomalies.

Desirable to know:
- Development of lymphatic system;
- Development of the integumentary system.

III. MICRO ANATOMY

Must know:
- General Histology, Study of the basic tissue of the body.

Desirable to know:
- Functional correlation of the structural components of the organs.

Must know:
- Systemic Histology,
- Structures of the organs of the various systems.
- To identify the structural components of the above after haematoxylin and eosin staining under compound light microscope.
- Electron microscopy of glomerulus.
- To stain the given tissue or organ of paraffin section with H&E and identify the features of the same.

Desirable to know:
- Identification of the cellular components in an election micrograph.

GENERAL HISTOLOGY

Cell:
Detailed structure of cell
Components and their functional mechanisms.

Primary Tissues

Epithelium:
Microscopic characteristics,
Types, functions, distribution,
Basal lamina, Cell junctions,
Specialization of the cell surface and their structural details and functions; metaplasia.

Connective tissue:
Cells, fibers and their structural features and functions.
Intercellular substances, amorphous ground substance,
Types of connective tissue (loose areolar tissue, dens connective tissue) and their distribution.
Specialized connective tissue:
Cartilage: different types of cartilages and their functions and distribution.
Bone: Cells, bone matrix, structural feature of compact and cancellous bone,
their distribution, and functions, ossification, blood supply of a long bone.

Muscle:
General features, detailed structure of : skeletal muscle,
Molecular mechanisms of contraction,
Innervations of skeletal muscle, Neuromuscular junction,
Morphological and histochemical basis of classification into type I and type II muscle fibers and their significance,
Structural and functional characteristics of cardiac and smooth muscle;
Innervations of cardiac and smooth muscle.

Nervous tissue:
Structural characteristics of a neuron, axon and dendrites.
Different types of neurons and their specific structural and functional features and distribution.
Axonal transport, synapse, morphological and functional characteristics of different types of synapses.
Neuroglia: types, structure and functions, blood brain barrier.
Brief cytoarchitecture of the central nervous system,
Regeneration in CNS with particular emphasis on stem cells.
Sensory and autonomic ganglia,
Peripheral nerves, myelin and myelination,
Degeneration and regeneration in peripheral nerves.

Systemic Histology of various organs/organ systems

Exocrine glands:
Characteristics, simple and compound gland;
Types of secretions, modes of secretion,
Detailed structural feature of a serous secreting cell and mucous secreting cell, Serous and mucous acini, duct system,
Features of salivary glands,
Exocrine pancreas,
Sweat and sebaceous glands,
Mammary gland,
Bulbourethral gland etc.

Circulatory system:
Structural features of heart;
Conducting and distributing arteries and arterioles;
Types of capillaries, their structural features and distribution and microcirculation.
Detailed structure of endothelium;
Structural characteristics of large and small veins and Venules arterio-venous shunts,
Lymphatics.

Respiratory system:
Structural feature of nose,
Nasopharynx, larynx, trachea,
Principal bronchi,
Lung including intrapulmonary bronchi, bronchioles,
Alveolar ducts, atria, alveoli,
Blood-air-barrier.
Functions of different parts of respiratory system.
Skin and nerve-end-organs:
- Thick, thin and hairy, skin
- Cell renewal and pigmentation of skin
- Skin appendages
- Healing of skin wounds
- Sensory receptors of skin
- Functions of skin

Immune system and lymphoid organs:
- Lymphocytes, their subtypes and functions
- Humoral and cell mediated immunity
- Thymus, lymph nodes, spleen
- Tonsils and other mucous associated lymphoid follicles

Digestive system (GIT):
- General organization, oral cavity, lip, cheek, tongue, taste buds, Salivary glands
- Layers of tubular digestive tract
- Esophagus, gastroesophageal junction
- Stomach, small intestine, large intestine, anal canal and rectoanal junction
- Liver, internal organization of liver, liver lobule, liver acinus
- Significance of zonation in liver acinus
- Liver sinusoids, detailed structure of hepatocyte, bile canaliculi, bile ducts, gall bladder
- Bile duct and pancreas

Endocrine glands:
- Thyroid, parathyroid
- Islets of Langerhan’s gland
- Adrenal cortex and medulla, their structural details, functional mechanisms
- Hypophysis cerebri, cell types secretion and their functions
- Hypophyseal portal circulation
- Common endocrine disorders

Urinary system:
- Detailed microscopic structure of kidney, cortex, medulla, pyramids
- Medullary rays, cortical columns
- Glomerulus, nephron, glomerular filtration
- Juxtaglomerular apparatus, its structural features and functions
- Renal interstitium
- Collecting ducts, renal sinus, minor and major calyces
- Microcirculation of kidney
- Histophysiology of the kidney
- Renal pelvis and ureters, urinary bladder and urethra

Female reproductive system:
- Ovary, ovarian stroma, primary and secondary graafian follicles
- Functions of various constituents and structural details of graafian follicles
- Corpus luteum and its functions, corps albicans
- Oviducts, uterus, arterial supply of uterus, cyclic changes in uterine endometrium, fertilization
- Vagina, female external genitalia
- Mammary glands

Male reproductive system:
- Testes, spermiogenesis, spermatozoon
Cycle of seminiferous epithelium, Sertoli cells, interstitial tissue Leydig cells, Histophysiology of testes, Epididymus, vas deferens, Prostate, seminal vesicles, penis.

Nervous system:
Cross section of spinal cord at various levels
Cross section of Medulla Oblongata at Pyramidal decussation
Sensory decussation
Mid Olive
Cross section of Pons at Upper & Lower level
Cross section of Mid brain at sup. & Inf. Colliculus levels
Histology of Cerebral & Cerebellar cortex

Special senses:
Structure of Retina, Cornea, Sclero corneal junction and Optic nerve
Structure of Organ of Corti, Vestibular apparatus
Structure of Olfactory epithelium

IV. MEDICAL GENETICS

Molecular Biology
Must know:
- Nucleus, DNA, chromosomes,
- Classification, karyotype,
- Chromosomal aberrations.

Desirable to know:
- Pathogenesis of chromosomal aberrations and their effects,
- Recombinant DNA.

Must know:
- Clinical Genetics,
- Pedigree charting,
- Dermatoglyphics,
- Buccal smear,
- Down’s syndrome,
- Klinefeller syndrome,
- Turner syndrome,
- Genetic markers.

Desirable to know:
- Genetic counseling, Population genetics. Practical genetics.

V. POSTNATAL GROWTH AND DEVELOPMENT

Must know:
- Meaning of the terms like growth,
- Development etc.;
- Principles of growth and development;
- Types of postnatal growth,
- Periods of growth and development and factors influencing them.
- Assessment of growth and development.

Desirable to know:
- Milestones of development.
- Growth and development during adolescence.

SKILLS

1. Location of arterial pulses of the superficial temporal artery, common carotid artery, axillary artery, brachial artery, radial artery, femoral artery, popliteal artery, posterior tibial artery and dorsalis pedis artery.
2. Palpation/location of great auricular nerve, ulnar nerve and common peroneal nerve.
3. Palpation and identification of the bony prominences around shoulder, elbow, wrist, hip, knee and ankle.
4. Identification/location of internal jugular vein, median cubital vein, dorsal venous arch of hand, great saphenous vein, small saphenous vein and dorsal venous arch of foot.
5. Location and surface anatomy of scrotal part of vas deferens, lungs, heart, liver, spleen and kidneys.
6. Identification of the structures in exposed parts of the eyeball, nose and oral cavity.
7. Staining of paraffin sections with H&E.
8. Buccal smear examination for sex chromatin.

**AREAS FOR INTEGRATED TEACHING**

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<th>S.No.</th>
<th>Area/subject</th>
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<tbody>
<tr>
<td>1.</td>
<td>Anatomical basis of birth control measures</td>
<td>Obstetrics &amp; Gynaecology, Community Medicine &amp; Surgery</td>
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<td>2.</td>
<td>Postnatal growth and development</td>
<td>Paediatrics and Community Medicine</td>
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<td>Genetic disorders</td>
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<td>Medical genetics</td>
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<td>Neuro-anatomy</td>
<td>Physiology</td>
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<td>Sex differences and age changes in bones</td>
<td>Forensic Medicine</td>
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<td>Normal and abnormal cells (cytology)</td>
<td>Pathology</td>
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<td>Anatomy of some important and common Clinical syndromes</td>
<td>Various clinical department</td>
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<td>Kinesiology – Movements at various joints</td>
<td>Orthopaedics</td>
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<td>Embryology basis of important and common Congenital anomalies</td>
<td>Pediatrics and Obstet &amp; Gynaecology</td>
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LIST OF BOOKS RECOMMENDED

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<td>1&lt;sup&gt;st&lt;/sup&gt; Notified test</td>
<td>- General Anatomy, Histology, Embryology and Upper Limb</td>
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<tr>
<td>2&lt;sup&gt;nd&lt;/sup&gt; Notified test</td>
<td>- General Histology, Embryology and Lower Limb</td>
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<td>- Gross Anatomy of Limbs, Abdomen, Pelvis &amp; Perineum, related Systemic Histology &amp; Embryology</td>
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<td>4&lt;sup&gt;th&lt;/sup&gt; Notified test</td>
<td>- Gross Anatomy of Thorax, related Histology and Embryology</td>
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<td>5&lt;sup&gt;th&lt;/sup&gt; Notified test</td>
<td>- Gross Anatomy of Head &amp; Neck (I), related Histology and Embryology</td>
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<td>- Gross Anatomy of Head &amp; Neck (II), related Histology and Embryology</td>
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<td>7&lt;sup&gt;th&lt;/sup&gt; Notified test</td>
<td>- Neuroanatomy, related Histology and Embryology</td>
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Send up Examination

**Paper I**
- General Anatomy, Embryology, Histology
- Gross Anatomy of Limbs, Abdomen, Pelvis & Perineum, related Systemic Histology & Embryology
- Medical Genetics

**Paper II**
- Gross Anatomy of -
  - Head & Neck, Neuroanatomy, Thorax
  - Postnatal Systemic Histology & embryology
  - Postnatal Growth and Development

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[*Internal Assessment is calculated as average of n-1 ("n" is total no. of tests conducted) For theory and Practicals separately]*
Human Physiology including Bio-Physics
HUMAN PHYSIOLOGY INCLUDING BIO-PHYSICS

PHYSIOLOGY

Learning Objectives

At the end of the course the learner shall be able to

1. Describe the normal functions and regulation of all organ systems in the body.
2. Apply this knowledge to understand the maintenance of homeostasis in the body.
3. Describe the physiological responses and adaptations to environmental stressors.
4. Apply the knowledge of the physiology of reproduction to promote the National Family Welfare Programme.
5. Apply this knowledge to understand the Patho-physiology, and treatment of disease.
6. Co-relate knowledge of Physiology with other medical disciplines.
7. Acquire skills to perform experiments, which demonstrate various physiological phenomena.
8. Analyze and interpret data obtained from experiments in Physiology.

Course Content-Theory

General Physiology

Must know:

Desirable to know:
Structure and function of the cell and its organelles, Ageing.

Blood

Must know:

Desirable to know:
Haemoglobin, Bilirubin metabolism, Jaundice and Complement system. AIDS

Nerve Muscle Physiology

Must know:
Structure of neuron and neuroglia.
Forces affecting the movement of ions across the cell membrane.
Genesis of the resting membrane potential, and conduction of the nerve impulse.
Classification of nerve fibers.
Nerve block, degeneration and regeneration of nerve fibers.
Structure and transmission across the neuromuscular junction. Drugs affecting neuromuscular transmission. Disorders of the neuromuscular junction - Myasthenia Gravis.
Effects of denervation.
Structure of cardiac muscle. Electrical potentials of cardiac muscle, length-tension relationship of cardiac muscle.

Desirable to know:


**Excretory System**

Must know:

Desirable to know:

**Digestive System**

Must know:

Desirable to know:
Other Gastrointestinal hormones, Digestion and absorption of carbohydrates, proteins and nucleic acids, electrolytes and water, lipids, vitamins, minerals, iron, calcium.

**Endocrine System**

Must know:
General principles of regulation of endocrine gland secretions.
Secretion, Chemical nature, mechanism of action, physiological actions and consequences of altered secretion of the hormones of the hypothalamus, anterior pituitary, posterior pituitary, thyroid, parathyroid, adrenal cortex, adrenal medulla, endocrine pancreas and gonads.

Physiology of growth. Role of hormones in stress.

Desirable to know:
Synthesis, transport and metabolism of all hormones. Hormone receptors and blockers. Functions of thymus and pineal glands. Physiological actions of local hormones.

Male and Female Reproduction

Must Know:
Control of onset of puberty. Pubertal changes in male and female. Menopause.
Actions of pituitary gonadotropins and prolactin in males and females.
Functional anatomy of male internal and external genitalia. Blood- testes barrier.
Spermatogenesis. Composition of semen. the male sexual act.
Actions and regulation of testosterone, and Control of testicular function.
Functional anatomy of female internal and external genitalia.
Cyclical changes in ovary, uterus, cervix, vagina and breast during menstrual cycle and hormonal regulation of the menstrual cycle.
Chemical nature, actions and regulation of secretion of estrogen, progesterone.
Indicators of ovulation. Common menstrual abnormalities.
Principles and methods of contraception in male and female.
Hormonal control of breast development after puberty and during pregnancy.
Control of milk secretion and milk ejection, and effect of lactation on menstrual cycle.

Desirable to know:

Cardiovascular System.

Must know:
Organization of cardiovascular system. Functional anatomy of heart and blood vessels.
Properties of cardiac muscle. Action potentials recorded from different tissues of heart.
Origin and spread of cardiac impulse.

Normal ECG: methods of recording, mechanism of production of different ECG waves in different leads. Physiologic basis of ECG, ECG abnormalities in common cardiac diseases and in electrolyte disturbances.

Cardiac cycle: Mechanical events, Heart sounds. Jugular venous pulse, arterial pulse.
Cardiac output: definition, physiological variations, principles of measurement and regulation. Basic principles of heart-lung preparation. Heart rate: Regulation, normal value and physiological variations.

Principles of hemodynamics.
Arterial, arteriolar, venous and capillary circulation.

Blood pressure: definition, types, variations and methods of measurement.
Integrated regulation of cardiovascular system.

General Topics

Desirable to know:

Respiration.

Must Know:
Functional anatomy of respiratory system.
Mechanics of respiration. Surfactant, Compliance.
Lung volumes and capacities. Pulmonary function tests.
Pulmonary circulation, normal values and regulation.
Content and partial pressure of oxygen and carbon dioxide in inspired air, expired air, alveolar air, arterial blood and venous blood.
Anatomical and physiological dead space and their significance.
Oxygen and carbon dioxide transport, oxygen hemoglobin dissociation curve, and factors affecting it.
Neural, reflex and chemical regulation of respiration.
Types of hypoxia and physiological basis of their classification.
Principles of ventilatory support. Oxygen therapy and hyperbaric oxygen.
Pathophysiology of common respiratory disorders.

General Topics.
Periodic breathing, respiratory adjustments during breath holding, hyperventilation, muscular exercise, cyanosis, hypercapnea, hypocapnea, asphyxia, high altitude, increased barometric pressure, drowning.

Desirable to know:
Work of breathing. Non-respiratory functions of the lung.

Central Nervous System.

Must know:
Organization and functional anatomy of central nervous system.
Neuronal organization and function at the levels of spinal cord.
Synaptic transmission. Reflexes, muscle spindle, regulation of muscle tone.
Sensory receptors and initiation of impulses in sense organs and ascending sensory pathways for different sensory modalities. Physiology of pain.
Nuclei and functions of thalamus.
Brain stem reticular system. Sleep, wakefulness, and EEG.
Organization of motor system. Descending tracts, corticospinal tract, and effects of lesions at different levels.
Functional anatomy, physiology, and functions of basal ganglia, cerebellum and vestibular apparatus. Effects of clinical and experimental lesions at various levels of neural axis.
Nuclei of hypothalamus and their functions. Regulation of body temperature.
Limbic system, connections, and physiological functions.
Functional areas of cerebral cortex.
Higher functions-Conditioned reflexes, learning, memory and speech and its disorders.
Formation, circulation and functions of CSF. Concept of blood-brain-barrier.
Organization and functions autonomic nervous system.
Facilitatory and inhibitory neurotransmitters.

Desirable to know:
Special Senses

**Must know:**
- Functional anatomy of the eyeball. Intra-ocular tension.
- Structure and functions of retina. Visual pathways and effect of lesion at various levels.
- Role of visual cortex in vision.

**Desirable to know:**
- Electrical responses in rods and cones. Electrophysiology of vision, and colour vision.
- Electroretinogram. Neurotransmitters in retina and visual cortex.

**Hearing**

**Must know:**
- Functional anatomy of external, middle and internal ear.
- Functions of external, middle and inner ear.
- Sound transmission and theories of hearing. Tympanic reflex, and masking.
- Role of auditory cortex in hearing. Sound localization.
- Types of deafness. Tests for hearing.

**Smell**

**Must know:**
- Receptors and pathways for smell. Cortical and limbic areas associated with smell.

**Taste**

**Must know:**

Course Content - Practical

The following list of experiments and demonstrations is not exhaustive. Additional experiments can be included as and when feasible and required.

Haematology

Practicals

**Must know:**
1. Principles of microscopy and use of microscope.
2. Total red cell count
4. Total leucocyte count
5. E.S.R & P.C.V
6. Preparation and staining of a blood smear
7. Performing differential leucocyte count and Arneth count
8. Absolute eosinophil count
9. Bleeding time and clotting time
10. Blood grouping – ABO & Rh
Demonstrations

Must Know:
1. Methods of collection of blood
2. Reticulocyte count
3. Platelet count.
4. Osmotic fragility of red cells

Nerve and Muscle

Practicals

Must Know:
1. Mosso’s ergography: Calculation of work done and effect of rate of work done on muscle fatigue.
2. Calculation of mechanical efficiency by i) bicycle ergometry and ii) treadmill.

Demonstrations

Must know:
1. Study of appliances used in amphibian practicals.
4. Electromyography and nerve conduction in humans.
5. Strength – Duration curve.
6. Effect of ions and drugs on small intestine of rabbit.

Reproduction

Demonstrations

Must know:
1. Changes in the vaginal epithelium, cervical mucus and the endometrium in different phases of menstrual cycle.
2. Pregnancy diagnostic tests.
4. Effect of hormones on uterine contractions in mammals.

CVS

Practicals

Must know:
1. Measurement of blood pressure.
2. Effect of posture and exercise on Blood pressure and heart rate.
3. ECG recording.
4. Clinical examination of CVS
5. Autonomic function tests: Valsalva maneuver, response to isometric exercise, deep breathing difference.
6. Cardiac function tests

Demonstrations

Must know:
1. Effect of drugs and vagal stimulation on frog heart.
2. Properties of Cardiac muscle.
4. Perfusion of mammalian heart and effect of ions on it.

**Respiration**

**Practicals**

**Must know:**
1. Clinical examination of respiratory system.
2. Pulmonary function tests including spirometry.
3. Measurement of chest expansion, breath holding time and maximum respiratory pressures.
4. Stethography.
5. Respiratory changes during exercise.

**Desirable to know:**
1. Donder’s model to demonstrate mechanics of respiration.
2. Cardiopulmonary resuscitation.

**Nervous system**

**Practicals**

**Must know:**
1. Examination of sensory functions
2. Examination of motor functions including reflexes
3. Examination of cranial nerves.

**Demonstrations**

**Desirable to know:**
1. EEG
2. Evoked potentials
3. Decerebrate and spinal frog.

**Special senses**

**Practicals**

**Must know:**
1. Acuity of vision
2. Colour vision
3. Perimetry
4. Tests for hearing.
5. Tests for smell and taste

**Demonstrations**

**Desirable to know:**
1. Ophthalmoscopy
2. Audiometry

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**Topics for Integrated Teaching**

**CNS:** The teaching of entire system to be integrated with anatomy
Anesthesiology: Pain

**Psychiatry:** EEG, sleep
Special senses: Ophthalmology and ENT.

**CVS:** Medicine / Cardiology: Blood pressure and hypertension, heart failure.
Surgery: Shock.

**Respiratory system:**
- Anaesthesiology: CPR
- DTCD: Pulmonary function tests

**Blood:**
- Microbiology: Immune mechanisms.

**Digestion:**
- Surgery / Medicine: Gastric secretion and peptic ulcer.

**Excretion:**

**Endocrines:**
- Medicine/endocrinology: Diabetes mellitus, thyroid disorders.

**Reproduction:**
The teaching of entire system to be integrated with the department of Obstetrics and Gynecology.

**General Physiology:**
- Anatomy/Biochemistry: Cell, cell membrane, transport across cell membrane.
- Medicine: Temperature regulation and pyrexia of unknown origin.

**Teaching learning Methods**
- Lectures, Small group discussion,
- Problem-solving exercise, Video clips, Self-learning.
- Practicals including demonstrations

**Learning Resource Materials.**
- Textbooks, Reference books, Internet sources, Practical Record

**BIO-PHYSICS**

(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 membranes 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)
BIOCHEMISTRY
BIOCHEMISTRY

DEPARTMENT OBJECTIVES

At the end of the learning period of one year in Biochemistry, the student shall be able to:

1. State the gross biochemical functions of the various systems if the human body.
2. recognize and state the correlation of the anatomical and Physiological features of the human body with biochemical functions.
3. state the biochemical basis for the normal and abnormal functioning of the human body.
4. point out the nature of biochemical defects in various disease states commonly encountered in clinical practice.
5. apply the biochemical knowledge so acquired in the practice of medical sciences.
6. continue to learn advancements in biochemistry and apply the same in medical practice as and when warranted.
7. develop an attitude to arrive at a provisional diagnosis of various biochemical disorders that can be encountered in clinical practice and motivate the affected persons in the community for proper management on the basis of the biochemical knowledge so acquired.
8. to perform qualitative and quantitative analysis of substances of biochemical importance in the human system and interpret the results.

COURSE CONTENT

1. EUKARYOTIC CELL STRUCTURE

Must know:
Cellular compartments – cellular environment organisation and composition of eukaryotic cells, functional role of subcellular organelles and membranes.

2. CARBOHYDRATE CHEMISTRY

Must know:
Definition, classification and nomenclature of carbohydrates, structure of glucose, biological importance and properties of glucose, fructose, galactose, lactose, maltose, sucrose, ribose starch, inulin, glycogen, aminosugars, deoxy sugars, heteropolysaccharides.
Desirable to know:
Sialic acids, blood group substances, carbohydrates of cell membranes.

3. LIPID CHEMISTRY

Must know:
Definition, classification, nomenclature of lipids, biological importance and properties of saturated and unsaturated fatty acids, triacylglycerol, phospholipids, glycolipids, prostaglandins, leukotrienes thromboxanes, glycerol, sterols, lipoprotein-structural characteristics, classification and biological importance. Characterisation of lipid, Rancidity, free radicals, lipid peroxidation and antioxidants.
Desirable to know:
Structure and functions of biological membrane, liposomes.
4. PROTEIN CHEMISTRY

Must know:
Definition, classification, composition of proteins, aminoacids, their classification and properties, protonic equilibria of amino acids, separatory techniques for amino acids and proteins – biologically important small peptides, conformation of proteins – levels of structural organisation. Plasma proteins, & Sturcture and functions of immunoglobulin

Desirable to know:
Structure of amino acids.

5. STRUCTURE – FUNCTION RELATIONSHIP OF PROTEINS

Must know:
Oxygen transport proteins – myoglobin structure and function – structural basis of physiological function of hemoglobin – co-operative binding, Bohr effect, role of 2,3 BPG, fetal haemoglobin, modification of Hb structure and disease – glycated haemoglobin, HbS, HbM, HbC, Thalassemias, Collagen structure and function.

6. NUCLEIC ACIDS

Must know:
Definition, structural description and functions of nucleic acids, their constituents and derivatives in our body. Biologically important nucleotides and their significance – synthetic analogues of purines and pyrimidines of medical importance.

7. ENZYMES

General characteristics of enzymes, enzyme nomenclature, mechanism of enzyme catalysis, enzyme kinetics, enzyme inhibition, organisation of multienzyme systems, regulation of enzyme activity in vivo, factors influencing enzyme activity, clinical enzymology.

Co-enzymes: Definition, concepts of cosubstrate, second substrate, role of co-enzymes in group transfer reactions, classification and biological significance.

Desirable to know:
Isolation, of enzymes and Structure of coenzymes

8. VITAMINS

Definition, classification, chemistry, occurrence, sources, metabolism, daily requirements, functions, deficiency manifestations, of A,D,E,K, Thiamin, Riboflavin, Niacin, Pantothenic acid, Biotin, Folic acid, Cobalamin, Pyridoxin, antivitamins, and hypervitaminosis.

9. DIGESTION AND ABSORPTION

Must know:
Mechanism of digestion and absorption in gastrointestinal tract of carbohydrates, lipids, proteins, aminoacids, vitamins, factors influencing digestion and absorption, role of dietary fibre.

Desirable to know:
Alterations in mechanisms of digestion and absorption leading on to disease process.
10. INTRODUCTION TO INTERMEDIARY METABOLISM

Must know:
Definition, bioenergetics – entropy, free energy, coupled reactions, high energy compounds, oxidation-reduction reactions – definition, redox potential, electron carriers, compartmentalisation of metabolic pathways in cells and the biologic advantage of such compartmentalisation.

Stages of catabolism of molecules:
i) Break down with no energy trap
ii) Break down with some force energy trap
iii) Final pathway consisting of Citric acid cycle, electron transport chain and oxidative phosphorylation.

Phosphorylation at the substrate level. Description, localization, organization of electron transport and uncouplers of oxidative phosphorylation, basic concepts of mechanism of oxidative phosphorylation, and inhibitors of electron transport chain.

a) Carbohydrates (without stress on structures): An overview and regulatory steps of glycolysis, glycogenesis, glycogenolysis, gluconeogenesis, HMP shunt, uronic acid pathway, interconversion of hexoses, metabolism of fructose and glucose, blood glucose homeostasis, overview of common disorders of carbohydrate metabolism and their clinical significance, diabetes mellitus and relevant biochemical investigations & oral glucose tolerance test.

b) Lipids: Overview of fatty acid synthesis, oxidation, ketosis, metabolism of triacyl glycerol, Phospholipids Prostaglandins, lipoproteins and cholesterol, biochemical basis of atherosclerosis, hyperlipoproteinemias, fatty liver obesity, role of adipose tissue, lipotropic factors and hypolipidemic drugs fatty liver.


d) Integration of metabolism of carbohydrates, lipids and amino acids, common metabolic pathway (TCA cycle).


f) Chemistry, Synthesis & Breakdown of hemoglobin, biochemical basis of jaundice, classification and their importance, bile pigments and their importance; overview of biochemical basis of porphyrias, hepato biliary function tests.

g) Minerals: Sources, daily requirements, absorption, biochemical functions and deficiency manifestations of calcium, phosphorus, iron, copper, zinc, iodine, sodium, potassium and chloride, selenium, chromium, and cobalt.

h) Nutrition: Calorie requirements, qualitative and quantitative requirements, specific dynamic action, BMR, factors influencing BMR, respiratory quotient, biological value of proteins, formulation and computation of energy requirements for a medical student, balanced and adequate diets, formulation of diets in health and diseases, protein and protein energy malnutrition, obesity, starvation.

i) Outline of detoxification mechanisms in human body.

Desirable to know:
Methods of investigations of intermediary metabolism; detailed aspects of metabolism of carbohydrates, rare disorders related to metabolism including glycogen storage disease; Rare disorders related to lipid metabolism. Detailed step in the breakdown of amino acids and rare inherited disorder related to amino acid metabolism.

Food toxins and additives; adulteration of foods, nutrification and fortification of foods; Basic concepts of total parenteral nutrition.

IV) ORGAN FUNCTION TEST:

Must know:

a) Constituents in urine, renal functions tests, concept of clearance tests.
b) Regulation of fluid and electrolyte balance, disorders associated with laboratory parameters in diagnosis of fluid and electrolyte disorders. Oral Rehydration solution.
c) Acid base balance, blood buffers, regulation of blood pH, role of erythrocytes, lungs and kidneys in regulation of acid base balance, acidosis, alkalosis of respiratory and non-respiratory origin, laboratory parameters in diagnosis of acid base disorders.
d) Gastric and pancreatic function tests and laboratory diagnosis of common gastric and pancreatic disorders.
e) Thyroid function tests.
f) Endocrinology: Mechanism of action and metabolic role of hormones.

Desirable to know:

- Detailed knowledge of porphyrias; Role of radio isotopes in Medicine; Fetoplacental unit; biochemical tests of fetal maturity and abnormalities.

V) Molecular Biology & Immunology

Must know:

(a) Basic biochemical concept of immunology.
(b) Overview of cell cycle, DNA replication, transcription and protein biosynthesis, mutations, DNA damage and repair mechanisms, blotting techniques.

General principles of recombinant DNA technology and its practical applications in medicine. Outline of biochemical basis of Carcinogenesis.

Desirable to know:

- Immunodiagnostic methods, Regulation of genetic expression in eukaryotes Inhibitors of protein synthesis, post translational modifications, gene therapy.

LIST OF PRACTICALS

1. General properties of carbohydrates and reactions of glucose, fructose, lactose, maltose, starch and dextrins.
3. Reactions to understand the properties of albumin, globulin, casein, gelatin and Peptone.
4. Qualitative analysis of milk and egg.
5. Normal constituents of urine.
6. Abnormal constituents of urine.
9. Analysis of a food mixture.
10. Principles and application of the principle in chromatography, electrophoresis, RIA and ELISA.
11. Quantitative estimation of glucose, urea, creatinine and total proteins in blood.
12. Demonstration of bilirubin estimation, prothrombin time determination, working of autoanalyser, blood gas analyser.

At the end of the practical classes in Biochemistry, the student shall be able to:

a) Identify the osazones of glucose, fructose, lactose and maltose, the color reactions of amino acids and the responsible functional groups.

b) Suggest suitable / relevant biochemical investigations for diagnosis/confirmation of a patient with jaundice, acute renal failure, nephrotic syndrome, proteinuria, edema, myocardial infarction, metabolic acidosis, metabolic alkalosis, respiratory acidosis, respiratory alkalosis, glycosuria, hypothyroidism, hyperthyroidism.

c) Calculate (i) albumin: globulin ratio with the values of total protein and albumin provided.

(i) Provided.

(ii) Urea and creatinine clearance with the parameters provided.

(iii) The RF value for any carbohydrate or amino acid from a given chromatogram.

d) Interpret (i) Normal electrophoretic pattern and pattern related / associated with cirrhosis of liver, nephrotic syndrome, multiple myeloma, mono and polyclonal gammopathies.

(ii) Values obtained after an oral glucose tolerance test in normal and diabetic states.

(iii) Laboratory data in pancreatitis, myocardial infarction, various types of jaundice, acute renal failure, nephrotic syndrome, proteinurias, acidosis, alkalosis, hypo and hyperthyroidism.

e) Mention/list the uses of some of the common instruments like centrifuges colorimeters pH meters, flame photometers, thermostatic water baths etc. used in biochemistry laboratory.

TOPICS FOR INTEGRATED TEACHING

<table>
<thead>
<tr>
<th>Topics</th>
<th>Departments</th>
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<tbody>
<tr>
<td>1. Molecular and functional organisation of cell</td>
<td>Anatomy and Physiology</td>
</tr>
<tr>
<td>2. Digestion and absorption</td>
<td>Physiology</td>
</tr>
<tr>
<td>3. Endocrinology and</td>
<td>Physiology, Pathology</td>
</tr>
<tr>
<td>4. Fluid, Electrolyte and acid-base homeostasis</td>
<td>Clinical departments</td>
</tr>
<tr>
<td>5. Nutrition and Dietetics</td>
<td>Clinical departments, Dietetics, Community Medicine, Paediatrics</td>
</tr>
<tr>
<td>6. Genetics</td>
<td>Anatomy</td>
</tr>
<tr>
<td>7. Function tests</td>
<td>Clinical departments, Physiology</td>
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</tbody>
</table>

These topics are not exclusive but suggestive. The integrated teaching program shall be spread over the entire MBBS course. Emphasis and reinforcement of basic concepts shall be done during the period of clinical postings of the students. Similarly over view of the applied aspects shall be taken care during the 1st and 2nd Semesters of MBBS course.

LIST OF BOOKS SUGGESTED FOR READING

<table>
<thead>
<tr>
<th>Author / Editor</th>
<th>Title of the Book</th>
<th>Publishers</th>
</tr>
</thead>
</table>
2. D.M. Vasudevan. Sreekumari S.

3. Chatterjee & Shinde

4. Albert L. Company
   Principles of Biochemistry W.H. Freeman and Lehninger, David

5. Lubert Stryer Company
   Biochemistry W.H. Freeman and

6. Devlin (Thomas M)

INTERNAL ASSESSMENT

a) Total number of notified tests : 8
b) Total number of notified practicals : 4

The notified tests taken for computing internal assessment in theory examination shall compulsorily include the terminal examinations conducted at the end of 1st and 2nd Semesters. The formula to be followed is \((n-1)\) where \(n\) represents the total number of notified tests, 1 represents the lowest scored by the candidate in the notified tests.

The marks obtained by the candidates in all the notified tests will be notified to the students.
PATHOLOGY
PHASE II

PARA CLINICAL SUBJECTS

PATHOLOGY

I. Goal

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

II. Learning Objectives

A MBBS student, at the end of the training in Pathology, will be able to:

1. Understand the concepts of cell injury and changes produced thereby in different tissue and organs and the capacity of the human body for healing.
2. Understand the normal homeostatic mechanisms, the derangements of these mechanisms and the effects on the human system.
3. Understand the etiopathogenesis, the pathological effects and the clinico-pathological correlation of common infectious diseases and non-infectious diseases like degenerative, metabolic, and immunologic conditions.
4. Understand the concepts of neoplasia with reference to the etiology, gross and microscopic features, diagnosis and prognosis in different tissues and organs of the body.
5. Correlate normal and altered morphology (macro and microscopic) of different organs in different diseases to the extent needed for understanding the disease process and their clinical significance.
6. Understand the common hematological disorders and the investigations necessary to diagnose them and determine their prognosis.
7. Describe the rationale and principles of technical procedures of diagnostic pathological laboratory tests.
8. Perform and interpret in a proper manner certain simple clinico-pathological procedures on blood, urine and other biological fluid samples.
9. Know the principles of collection, handling, storage and dispatch of clinical samples from patients in a proper manner.

III. Course contents

III A. General Pathology


Must know

a) Cause and mechanism: Ischemic, Toxic, Free- radical induced, Apoptosis
b) Reversible cell injury: Types, morphology, hyaline and fatty change
c) Irreversible injury: Necrosis and gangrene
d) Calcification: Dystrophic and metastatic
e) Extra cellular accumulations: Amyloidosis – classification, pathogenesis, morphology and pigment deposition such as melanin, bilirubin, hemosiderin and carbon

III A 2. Inflammation and Repair
Must know
Acute inflammation: Features, Causes, vascular, cellular events and morphological
variants
Inflammatory cells and mediators
Chronic inflammation: Causes, types, non-specific and Granulomatous with examples
Wound healing and repair by primary and secondary union and factors modifying
them.
Healing at specific sites like bone

III A 3. Hemodynamic disturbances

Must know
Oedema: Pathogenesis and types
Chronic venous congestion: Lung, Liver and Spleen
Thrombosis and Embolism: Formation, Types and Fate, Effect on tissues
Infarction: Types and Common sites
Shock: Pathogenesis, types and morphology

III A 4. Growth Disturbance and Neoplasia

Must know
Atrophy, Hypertrophy, Hyperplasia, Aplasia, Malformation, Metaplasia
Dysplasia and Intraepithelial Neoplasia including carcinoma in situ, Premalignant
conditions
Neoplasia: Causes, Classification, Histogenesis and molecular basis, Biological
behaviour, Benign versus Malignant, Nomenclature
Malignant Neoplasms: Grade and Stage, metastasis and invasion
Carcinogenesis: Environmental carcinogens, viral, chemical, occupational, hereditary
Laboratory Diagnosis of cancer, Tumor markers, Paraneoplastic syndromes
Gross and microscopic features, clinical correlation, mode of spread and prognosis of
common benign and malignant tumors.

Desirable to know
Tumor and host interaction, Tumor immunology

III A 5. Immunopathology

Must know
Immune system: Organization, cells, antibodies and regulation
Hypersensitivity: types and examples
Immune deficiency: primary and secondary
Autoimmune Diseases both organ specific and systemic with specific examples like
SLE, Hashimoto thyroiditis
Organ Transplantation: Immunologic basis of rejection, Graft versus Host reaction

Desirable to know
Specific Organ Transplantation like Bone marrow, Stem cell, Renal
Use of immunopathology in laboratory diagnosis like immunofluorescence,
immonhistochemistry, flow cytometry

Note: The topic of immunopathology is generally also covered in details by Microbiology
and Biochemistry Departments, hence it would be useful to integrate with the other
departments and prepare specific departmental objectives so as to avoid overlap in the
matter taught.

III A 6. Infectious Diseases

Must know
Etiopathogenesis, gross and microscopic features, clincopathological correlation, relevant
investigations and complications of commonly prevalent infections like Mycobacterial
diseases: Tuberculosis and Leprosy
Bacterial Diseases: Pyogenic, Typhoid, Meningococcal, Syphilis, Bacillary Dysentry
Fungal diseases, Actinomyosis, Rhinosporidiosis, Opportunistic infections
Parasitic diseases: Malaria, Filaria, Kala Azar, Amebiasis, Cysticercosis, Hydatid
Viral diseases: Herpes, Hepatitis, Rabies, Dengue
HIV infection and AIDS: Aetiology, Mode of transmission, Diagnostic procedure and
handling of infected material and health education

Note: The above mentioned infections are also covered in details by Microbiology
Departments, hence it would be useful to integrate with them and prepare specific
departmental objectives so as to avoid overlap in the matter taught

III A 7. Miscellaneous Disorders

Must know
Autosomal and sex-linked disorders
Metabolic disorders like Diabetes Mellitus, Lysosomal Storage disorders
Nutritional disorders – Protein Energy Malnutrition, Vitamin deficiency
Occupational and environmental pathology – Radiation Injury, Pneumoconiosis

Desirable to know
Pathology of alcohol and smoking
Cystic fibrosis
Obesity

III B Systemic Pathology

III B 1. Hematopathology

Must know
Constituents of blood and bone marrow, regulation of hematopoiesis
Anemia: Classification and clinical features, Laboratory approach
Nutritional anemia: Iron deficiency, Vitamin B12 and Folate deficiency
Hemolytic Anemia:
Classification and Laboratory diagnosis
Thalassemia, Hemoglobinopathy like Sickle cell anemia
Hereditary Spherocytosis, G6PD deficiency
Acquired hemolytic anemia: Autoimmune hemolytic and Microangiopathic
hemolytic anemia, hemolytic disease of newborn
Aplastic Anemia, PNH, Pancytopenia, myelophtisis anemia
Leucocyte disorders like Leucocytosis, Leukemoid reaction, Leucopenia
Leukemia: Acute and Chronic – classification and diagnosis
Other chronic myeloproliferative disorder
Myelodysplastic syndromes
Hemostatic disorders: Platelet deficiency, ITP, Coagulation disorders like Hemophilia,
Von Willebrand Disease, DIC
Plasma cell dyscrasia
Blood transfusion practice: Grouping, Cross Matching, Donor selection, Component
therapy, Rational Use of blood transfusion, Adverse reactions and transmissible
infections

III B 2. Cardiovascular Pathology

Must know
Rheumatic Heat Disease
Infective endocarditis
Hypertension
Atherosclerosis and Ischemic heart Disease
Desirable to know
Congenital Heart Diseases like VSD, ASD, Fallot’s Tetralogy, PDA
Pericardial Diseases
Cardiomyopathy
Vasculitis and Aneurysm
Cardiac tumors like Myxoma

III B 3. Respiratory Pathology

Must know
Structure of bronchial tree and alveoli, normal and altered lung function, concept of obstructive and restrictive lung disease
Inflammatory diseases of lung like Chronic Obstructive Pulmonary disease, Emphysema, Chronic Bronchitis, Bronchial Asthma, Bronchiectasis
Pneumonia
Lung Abscess
Pulmonary Tuberculosis
Lung tumors: etiopathogenesis and types

Desirable to know
Hyaline Membrane Disease and ARDS
Interstitial lung disease
Nasopharyngeal and Laryngeal tumors
Mesothelioma

III B 4. Pathology of Gastrointestinal tract

Must know
Oral pathology: Leucoplakia, Premalignant conditions and Carcinoma
Salivary gland pathology: Common benign and malignant tumors, Sjogren Syndrome
Diseases of esophagus: Barrett Esophagus and Carcinoma
Gastritis – types, H. Pylori infection
Tumors of stomach: benign and malignant
Inflammatory diseases of intestine: Typhoid, Tuberculosis, Amebic colitis, Ulcerative colitis, Crohn’s disease
Intestinal tumors: Polyps, Carcinoma, Lymphoma and Carcinoid
Appendicitis

Desirable to know
Hirschsprung disease
Malabsorption diseases
Pancreatitis and Pancreatic tumors

III B 5. Liver and Biliary Tract pathology

Must know
Jaundice: types, etiopathogenesis, differential diagnosis
Hepatitis: Acute and Chronic, Pathology
Cirrhosis: Etiology, classification, Post necrotic, alcoholic, metabolic Morphology, complications
Alcoholic liver disease
Gall bladder diseases: Cholecystitis, cholelithiasis, carcinoma
Tumors of liver: hepatocellular carcinoma, metastasis

Desirable to know
a) Liver function tests
b) Liver failure
c) Portal hypertension

III B 6. Lymphoreticular Pathology
Must know
a) Lymphadenopathy – Causes, Lymphadenitis, infectious and non-infectious
b) Lymphoma: Hodgkin and Non- Hodgkin – classification scheme and morphology of selected lymphomas
c) Diseases of spleen – splenomegaly, hypersplenism

III B7. Urinary tract pathology

Must know
a) Renal function tests
b) Urinalysis
c) Acute and Chronic renal failure
d) Glomerulonephritis: Post streptococcal, Crescentic, Secondary
e) Nephrotic Syndrome
f) Acute tubular necrosis
g) Urinary tract infection and Pyelonephritis
h) Nephrolithiasis
i) Renal tumors : Renal cell carcinoma, Wilms Tumor
j) Urinary bladder: cystitis, urothelial carcinoma

Desirable to know
a) Renal vascular disorders
b) Polycystic kidney disease
c) End-stage renal disease
d) Renal tuberculosis

III B 8. Pathology of Reproductive System

Must know
a) Diseases of cervix: Cervical carcinoma, PAP stain, Screening and diagnosis
b) Hormonal influences and histology of different phases of endometrium
c) Endometrial hyperplasia and carcinoma, Smooth muscle tumor, Endometriosis
d) Trophoblastic diseases: Hydatidiform mole and Choriocarcinoma
e) Ovarian tumors
f) Diseases of breast – fibrocystic disease, Fibroadenoma, Breast Carcinoma, Phylloides tumor
g) Disease of penis- premalignant and carcinoma
h) Nodular hyperplasia of prostate and carcinoma prostate
i) Tumors of testis

Desirable to know
a) Semen analysis and investigation of infertility
b) Pelvic inflammatory disease
c) Vulval and vaginal diseases
d) Genital tuberculosis

III B 9. Pathology of Musculoskeletal system

Must know
a) Osteomyelitis – Acute, chronic, tuberculosis
b) Metabolic bone disease – Rickets, Osteomalacia, Osteoporosis
c) Tumors: Classification, Osteosarcoma, Chondrosarcoma, Giant cell tumor, Ewing’s sarcoma, Metastatic bone tumors

Desirable to know
a) Paget’s disease of bone
b) Muscular dystrophies
c) Arthritis: Rheumatoid, Osteoarthritis, Tuberculous
d) Tumors of jaw: like Ameloblastoma
III B 10 Endocrine Pathology

Must know
a) Non neoplastic lesions of thyroid: Thyroid function tests, Iodine deficiency, Goitre, Autoimmune thyroiditis, Myxedema and thyrotoxicosis
b) Tumors of thyroid
c) Adrenal diseases: Hyperfunction and hypofunction, Tumors
d) Parathyroid hyperplasia and adenoma
e) Pituitary hyperfunction and hypofunction, tumors
f) Multiple endocrine neoplasia

III B 11. Neuropathology

Must know
a) CSF and its disturbance
b) Inflammatory disorders: Meningitis and Brain abscess
c) CNS tumors: Astrocytoma and Meningioma: classification

Desirable to know
a) Degenerative diseases like Alzheimer’s and PRION disease
b) Cerebrovascular diseases: Hemorrhage, Aneurysm, Infarction
c) Traumatic lesions
d) Peripheral neuropathy and demyelinating diseases

III B 12. Miscellaneous

Must know
a) Skin tumors like Melanoma, Basal cell carcinoma, Squamous cell carcinoma

Desirable to know
Bullous lesions of skin
Dermatological conditions like Psoriasis, cutaneous tuberculosis
Diseases of eye like Retinoblastoma

IV Acquisition of Skills

a) Be able to collect, store and transport materials for various pathological tests including histopathology, cytopathology, hematopathology, Blood bank and clinical pathology in a proper manner.
b) Describe accurately and arrive at a logical diagnosis of common macroscopic specimens (gross appearance) such as pneumonia, cirrhosis, gangrene etc
c) Interpret and arrive at a conclusive diagnosis in the microscopic analysis of common diseases like tuberculosis, carcinoma, acute inflammation etc.
d) Perform with accuracy and reliability various hematological procedures such as Hemoglobin estimation, Total and differential leucocyte count, peripheral smear staining and reporting.
e) Calculate red cell indices and interpret the significance
f) Perform independently complete examination of urine and detect abnormal findings and interpret the results
h) Perform independently grouping of blood.
i) Be aware of the procedure for common tests like Bleeding time, Clotting time, ESR, PCV, bone marrow examination, semen analysis and interpret abnormal findings.
j) Interpret abnormal laboratory (biochemical, hematological and serological) values of common diseases.
k) Adopt universal precautions for self protection against HIV and hepatitis

V Teaching and learning methodology
The stress should be on teaching basic fundamentals of the disease process and applied aspects relevant to the clinical subjects

a) General Pathology – Taught in semester one (July to December)

Taught with the help of didactic lectures followed by practical pertaining to the topic. Besides microscopic examination of slides, fresh specimens obtained during surgical operations may be shown. Students to be encouraged to do self learning and small topics may be given to them in advance for group discussion and presentation. At the end of one topic tutorials may be arranged to facilitate learning

b) Hematology and Systemic Pathology – Second and Third Semester (January to May and June to November of the subsequent year)

The following modalities may be adopted
1. Didactic lecture
2. Case based discussion
3. Clinicopathological conferences
4. Practical demonstration of gross and microscopic features of cases
5. Seminars where the students are encouraged to speak and discuss on various topics that are allotted to them in advance.
6. Fortnightly tutorials where the students will be asked to prepare a topic and the tutor will ask questions, discuss problems and clarify doubts regarding the topic.
7. Other modalities that should be encouraged include Problem Based learning, Integrated teaching modules and self-learning tools including web-based learning.

VI Practicals

1. One third of the allotted practical hours be devoted to:

   a) Perform a complete urine examination and detect abnormalities and correlate clinically.
   b) Perform with accuracy and reliability various hematological procedures such as Hemoglobin estimation, Total and differential leucocyte count, peripheral smear staining and reporting and blood grouping
   c) Observing or performing under guidance tests like bleeding time, Clotting time, ESR, PCV, bone marrow examination, semen analysis and interpret abnormal findings.

   A. One third of the practical hours allotted should be devoted to Identify and interpret gross and microscopic feature of:

      a) Acute inflammation like acute appendicitis, pneumonia, meningitis
      b) Chronic cholecystitis
      c) Granulomatous inflammation like tuberculosis
      d) Granulation tissue and Ulcer
      e) Typhoid, tuberculous and amebic ulcers
      f) Common infections like Leprosy, Malaria, Filarial lymphnode, Rhinosporidiosis, Hydatid disease, Actinomycosis, Mycetoma, Molluscum contagiosum
      g) Fatty liver, Amyloidosis, Venous congestion of lung, liver and spleen
      h) Types of necrosis
      i) Common benign and malignant tumors like Squamous cell carcinoma, Basal cell carcinoma, Adenoarcinoma, Hemangioma, Lipoma, Melanoma, metastatic tumors etc
j) Common systemic diseases like Cirrhosis, Pyelonephritis, Peptic ulcer, Rheumatic Heart Disease, Bronchiectasis, Osteomyelitis  
k) Specific tumors of various organs like Cervical cancer, Uterine leiomyoma, Seminoma, Osteosarcoma etc  

B. One third of the allotted practical hours to be devoted to  

a) Discussion of case studies based on the actual clinical and laboratory findings of patients along with gross and microscopic findings wherever applicable to learn clinicopathological correlation.  
b) Observation of post mortem examination if undertaken and discuss the clinicopathological correlation. In case clinical post mortems are not available then got-up specimens may be arranged to enable students to appreciate such cases.  

Notified tests including send-up: Total 6  

1. Mid Semester Test One – Middle of third semester  
2. End of third semester Test  
3. Mid Semester Test Two - Middle of fourth semester  
4. End of fourth semester Test  
5. Mid semester Test Three – Middle of fifth semester  
6. End of fifth semester - Send-up Examination  

The three End semester test should be based on the university exam pattern with theory, practical and oral examinations.  

The three mid-term tests may be based on Multiple Choice Questions, Short Structured theory test, OSPE, or even Orals. Multiple Choice Questions are to be encouraged in the formative assessments as much as possible.  

For the calculation of internal assessment for theory, the average marks secured by the candidate in all the tests including the send-ups minus one test with the lowest score (n-1) will be taken.  

For the calculation of internal assessment for practical, the average marks secured by the candidate in all the tests including the send-ups minus one test with the lowest score (n-1) will be taken.  

A candidate has to secure at least 35% or more in the internal assessment for theory and practical to be eligible for appearing in the final examination.  

VIII Areas of integrated teaching  

Anemia – Medicine, Gynecology, Pediatrics  
Bleeding disorders - Medicine, Pediatrics  
Tuberculosis – Medicine, DTCD  
Nephrotic and Nephritic syndromes – Medicine  
Cirrhosis – Medicine, Surgery  
Ischemic heart disease – Medicine, Cardiology  
Diabetes Mellitus – Medicine  
Jaundice – Medicine, Surgery, Pediatrics  
Peptic ulcer - Surgery  
Carcinoma breast - Surgery  
Splenomegaly - Medicine  
Leukemia – Medicine, Pediatrics  
Bone tumors -Orthopedics  
Carcinoma Cervix - Gynecology
IX Suggested Books for reading

b) Basic Pathology Robbins *WB* Saunders Co., Philadelphia
c) General Pathology *JB Walter, MS Israel*. Churchill Livingstone, Edinburgh.
d) Underwood’s Pathology, International Student Edition
e) Text book of Pathology by Harsh Mohan
f) Practical Pathology by Uma Chaturvedi and Tejindar Singh
MICROBIOLOGY
MICROBIOLOGY

Learning objectives:

At the end of the course, the learner shall be able to understand the infectious diseases in terms of their etiology, pathogenesis, and laboratory diagnosis in order to efficiently treat, prevent and control the disease. To achieve this, the student should be able to:

1. Describe mechanism of host-parasite relationship.
2. Enumerate normal microbial flora and its importance in health and disease.
3. Describe etiology and pathogenesis of common infectious diseases.
4. Describe etiology and pathogenesis of opportunistic infections.
5. Choose appropriate laboratory investigation to support clinical diagnosis with respect to proper sample collection, timing and transport of the specimens.
7. Understand the mechanism of immunity to infections.
8. Explain scope of immunotherapy and vaccines for prevention of infectious disease.
9. Perform simple tests to arrive at rapid diagnosis.
10. Apply appropriate method of sterilization, disinfection and biomedical waste disposal in hospital and community practice.
11. Explain the importance of National Health Programmes for prevention of communicable diseases.

Course Contents

The student must know the following principles in:

General Microbiology:
- General concepts of infectious diseases prevalent in India (morbidity, mortality data)
- Significant milestone in history of infectious diseases
- Definitions pertaining to infectious diseases. (eg: host, parasite, endogenous, exogenous, transmission, routes, source, reservoir etc)
- Classification of microbes form clinical view point
- Normal human microbial flora of and its importance in health and disease.
- Bacterial cell: anatomy, physiology and genetics in relation to virulence and human infections and diagnosis.
- Sterilization, disinfections and standard precautions in patient care and disease prevention.
- Bacteriophage in relation to virulence and epidemiology.
- Antimicrobials, mode of action, testing, interpretation of results and rational use, mechanism of resistance.

Immunology:
- Immune apparatus, lymphoid organs, Immunobiology
- Antigen and antibody.
- Ag+Ab-reactions, serology and immunological assays.
- Cell and humoral immunity in health and disease
- Hypersensitivity
- Immunodeficiency
- Tumor immunity / transplantation an auto-immunity
- Immunotherapy

Systematic Bacteriology:
- Gram positive / Negative cocci / Bacilli, Vibrio, Campylobacter, Helicobacter associated with human infections.
Mycobacteria.
Anaerobic bacteria
Spirochaetes
Chlamydia, Rickettsia, Mycoplasma
Miscellaneous bacteria of clinical importance.
Legionella, Listeria etc.

Virology:
- General properties, structure, replication, classification.
- Virus, host interaction and pathogenesis
- Antiviral agents.
- General concepts in laboratory diagnosis of viral infections.
- Herpes, Adeno, Arbo, Picorna, Orthomyxo, Paramyxio, Rabies, HIV, Hepatitis,
- Miscellaneous virus of medical importance: (Rota, Corona, etc)
- Viral vaccines.
- Pox, slow and oncogenic.
- Opportunistic viral infection.

Parasitology:
- General concepts and definition of key terms, infections of national prevalence.
- Protozoal infections prevalent in India:
  - Intestinal,
  - Blood
  - Genital
  - Other protozoal infections
- Helminthes (Intestinal and tissue) prevalent in India.
  - Cestodes,
  - Nematodes:
    - Trematodes.
- Opportunistic Parasitic infection.

Mycology:
- General properties and classification of fungal diseases, pathogenesis, approach to laboratory diagnosis (sample collection, identification), antifungal agents
- Opportunistic fungal infections.

Applied Microbiology:
- CNS Infections: Acute and chronic meningitis, encephalitis and brain abscess.
- PUO/FUO: Infective and non infective causes and approach to diagnosis.
- Sepsis
- Diarrhoeal diseases (including food poisoning)
- Respiratory Tract Infection (Upper & Lower)
- UTI
- Wound infections
- Skin and soft tissue infections
- Eye and ear infections
- Sexually transmitted infections
- Female genital tract infections
- Infections in immuno-compromised individuals
- Bone and Joint infections
- Hospital Associated Infections and its prevention, (Universal precaution and hospital waste management
- Zoonotic diseases.
- National Programmes of Communicable Diseases.
- Investigation of outbreaks and notification
- Congenital infections

Bacteriology of food, water and milk

SKILLS
The student should be able to perform the following skills independently:

1. Collection of relevant clinical samples.
   - Blood for culture and serological test
   - Urine for culture
   - Swabs for microscopy and culture
   - Body fluids for microscopy and culture
2. Storage and transport of the clinical specimens
3. Preparation of smears from clinical material
   - Ziehl – Neelsen stain
   - Stool for ova and cyst
   - Blood smear for parasites (MP, Mf).
   - Albert stain for diphtheria

Under supervision
   - India ink of CSF for Cryptococcus
   - Modified Z-N stain for M.leprae.
   - KOH for fungal elements
6. Biomedical waste disposal: Needle, sharps disposal, infectious material
7. Interpretation of Microbiology reports:
   - Serology: VDRL, HIV, Hepatitis, ASO, RF, Widal Test.
8. Antibiotic sensitivity: Rational use of antibiotics

METHOD OF ASSESSMENT:
Modified essay question, Microscopic examination, Short answer question, MCQs, Problem solving exercises, OSPE, Records Review, Checklist and Oral viva Voce

TEACHING LEARNING METHODS:
Structure interactive sessions, small group discussion, Role play, Practical including demonstration, Problem based exercise, video clips, written case scenario, Self learning tools, interactive learning and e-modules.

TIME OF EVALUATION:
Summative examination of microbiology should be at the end of 5th semester and formative assessment at the end of 3rd & 4th semesters. Practical and viva examinations can be held in between term. MCQs for midterm assessment. Average of the examinations held is to be calculated for Internal assessment.

LEARNING RESOURCE MATERIAL:
Text books, Reference books, Practical notebooks, Internet resources and video films etc.

Suggested horizontal integration:

1. PUO
2. Diarrhoea
3. Tuberculosis
4. Wound infections
5. Eye and Ear infections
6. CNS infection
7. Zoonotic diseases
8. Congenital infections
9. Female Genital Tract Infections

Suggested Books in Microbiology:
Text book of Microbiology by Jawetz
Text book of Microbiology by Greenwood
Text book of Microbiology by Ananthnarayan & Paniker
Text book of Parasitology by D R Arora
Text book of Parasitology by R Bhatia & R L Ichpujani
PHARMACOLOGY
PHARMACOLOGY

OBJECTIVES:
(a) Knowledge & Intellectual skills
At the end of the course, the learner shall be able to:

1. Understand the general principles of drug action and handling of drugs by the body in normal individuals including children, elderly, women during pregnancy & lactation; special situations like renal, hepatic disease and genetic variations.
2. Prescribe drugs rationally by:
   a) Understanding the importance of both non-drug treatment and drug treatment.
   b) Selecting and prescribing drug(s) based on suitability, tolerability, efficacy and cost according to the needs of the patient for prevention, diagnosis and treatment of common ailments.
   c) Choose the most appropriate formulation for the clinical condition.
   d) Use antimicrobials judiciously for therapy and prophylaxis.
   e) Avoid simultaneous use of drugs resulting in harmful interaction(s)
3. Prescribe drugs for the control of fertility and be aware of the effects of drugs on the foetus.
4. Apply pharmacokinetic principles in clinical practice pertaining to the drugs used in commonly encountered clinical conditions and essential medicines.
5. Prescribe rationally, in a legible manner, using appropriate format and terms, medicines for common ailments and all National Health programmes.
6. Foresee, prevent and manage adverse drug events and drug interactions
7. Understand and implement the essential medicines concept for improving the community health care.
8. Principles of pharmacoeconomics
9. Sensitization to evidence-based medicine
10. Describe the clinical presentation and management of common poisonings including bites and stings.
11. Judiciously use “over the counter” drugs and be aware of ill effects of social use of intoxicants.
12. Prescribe drugs (s) for the control of fertility.

(b) Psychomotor Skills:
At the end of the course, the learner shall be able to:

1. Write a correct, complete and legible prescription for common ailments including the diseases in the National Health Programmes.
2. Calculate the drug dosage using appropriate formulae for an individual patient.
3. Administer the required dose of different drug formulations using appropriate devices and techniques (e.g., hypodermic syringes, inhalers, transdermal patches etc).
4. Advice and interpret the therapeutic monitoring reports of important drugs
5. Recognize and report adverse drug reactions to suitable authorities.
6. Analyse critically, drug promotional literature for proprietary preparations, in terms of the (a) pharmacological actions of their ingredients (b) claims of pharmaceutical companies (c) economics of use (d) rational or irrational nature of fixed dose drug combinations.
7. Retrieve drug information from appropriate sources, especially electronic resources.

(c) Attitudes & Communication skills:
At the end of the course, the learner shall be able to:

1. Communicate to patients regarding the optimal use of drug formulations, devices and storage of medicines.
2. Follow the drug treatment guidelines laid down for diseases covered under the
National Health Programmes and be capable of initiating, monitoring treatment, recording progress, and assessing outcomes.

3. Motivate patients with chronic diseases to adhere to the line of management outlined by the health care provider.

4. Appreciate the relationship between cost of drugs and patient compliance.

5. Exercise caution in prescribing drugs likely to produce dependence and recommend the line of management.

6. Understand the legal aspects of prescribing drugs.

7. Evaluate the ethics, scientific procedures and social implications involved in the development and introduction of new drugs.

COURSE CONTENTS

Must know

General Pharmacology

Pharmacology: Definition, scope, various branches
General principles and mechanism of drug action
Concept of therapeutic Index and margin of safety
Drug nomenclature

Clinical Pharmacology – Basic Concepts

Scope and relevance of clinical pharmacology
Routes of administration of drugs, drug delivery system
Pharmacokinetics – Absorption, Distribution, Metabolism, Excretion
Bioavailability and bioequivalence
Factors modifying drug action and drug dosage
Drug interactions, Pharmacogenomics, Pharmacogenetics
Adverse Drug Reactions, Pharmacovigilance,
Therapeutic drug monitoring & Adherence
Essential drugs and fixed dose drug combinations, Pharmacoeconomics, Rational drug use, P-drugs
Drugs and drug combinations that are banned in India

Desirable to know

Molecular mechanism of drug action
Drug Regulation & Drug Acts, Legal aspects, Inventory Control
Phases of clinical trials
Drug dose relationships and basic principles of bioassay and biostandadisation.

Autonomic Pharmacology

Must know

1. Outline the general principles of autonomic neurotransmission –enumerate the various types and sub-types of receptors and their agonists and antagonists, there therapeutic indications, contraindications, common side effects
2. Outline steps in the pharmacotherapy of organophosphorous and atropine poisonings, pharmacotherapy of glaucoma and myasthenia gravis.
3. Skeletal muscle relaxants.

Autacoids and related drugs

Definition, How they differ from hormones, actions of autacoids.
Histamine receptor antagonists, their pharmacological actions, indications, adverse effects and precautions.
Pharmacology of drugs acting on prostaglandins, 5-HT receptors, Leukotrienes, Platelet Activating Factors and Bradykinins.

Central Nervous System, Psychopharmacology, Drugs used in Anaesthetic Practice

Introduction to CNS, Neurotransmitters
Drugs used in epilepsy, selection of appropriate drug for various types of epilepsy and adverse effects of drugs.

Hypnotics used currently in clinical practice, indications, contraindications, adverse effects, drug interactions

Opioid analgesics: Pharmacological actions, indications, contraindications, adverse effects and drug interactions of commonly used analgesics

Non-steroidal anti-inflammatory drugs (NSAIDs): Pharmacological actions, indications, contraindications, adverse effects and drug interactions of commonly used drugs.

Drugs used in the treatment of Parkinson’s disease: anticholinergic agents, dopamine agonists, MAOI, COMTI; their indications, contra-indications, adverse effects and drug interactions

Drugs used in other neurodegenerative disorders.

Disease modifying agents in the treatment of rheumatoid arthritis

Pharmacology of ethanol and methanol poisoning

Agents used in the treatment of gout (acute and chronic)

Drugs used for psychosis, anxiety, depression, and manic depressive illness

Drugs of addiction/abuse and dependence

General anaesthetics; Cardinal features, merits and demerits of commonly used anaesthetics, drug interactions

Pre-anaesthetic adjuvants: uses, indications, contraindications, adverse effects and drug interactions

Local Anaesthetic agents: Pharmacological basis, adverse drug reactions, indications and complications of spinal anaesthesia

Neuroleptanalgesia, Disassociative anaesthesia

Endogenous opioid peptides, and their functions, opioid receptors and their subtypes; Centrally acting muscle relaxants, Directly acting muscle relaxants.

Cardiovascular system

1. Antihypertensive drugs, their mechanism of action, adverse drug reactions, drug interactions and basis of combining commonly used drugs
2. Management of Hypertensive emergencies
3. Pharmacology of calcium channel blockers
4. Drugs affecting Renin Angiotensin system, Nitric oxide donors and inhibitions
5. Approaches to treatment of myocardial Infarction and unstable angina: Drugs used in treatment of angina pectoris
6. Vasoactive Peptides
7. Drug treatment of peripheral vascular diseases
8. Pharmacology of vasodilators and cardiac glycosides; usage in CHF
9. Classification of Ant-arrhythmic drugs, they Pharmacological acts & indication
10. Treatment of paroxysmal supraventricular tachycardia, Atrial dysrhythmias, sudden cardiac arrest and ventricular fibrillation.
11. Properties and indications of plasma expanders
12. Drug treatment of shock

Diuretics

Diuretics: Calcification, mechanism of action, pattern of electrolyte excretion under their influence

Short term side effects and long term complications of diuretic therapy

Therapeutic uses of diuretics

Drugs affecting blood and blood formation

Anti-anaemic drugs: Mechanisms of iron absorption from GIT and factors modifying it, adverse drug reactions, oral and parenteral preparations, treatment of iron deficiency anaemia, pharmacology of folic acid, vitamin B12, vitamin K, erythropoietin


Drugs inhibiting platelet aggregations, their indications and precautions for their use.

Fibrinolytics and anti-fibrinolytics: Indications, adverse reactions Coagulants, local
haemostatics.

**Hypolipoproteinemia drugs:** Mechanism of actions, adverse drug reaction and indications

**Respiratory system**

Drugs used in the treatment of bronchial asthma, mechanism of action, common side effects and precautions to be taken during their use.

**Antitussives:** pharmacological actions, indications, contraindications and common side effects.

**Expectorants and mucolytic agents:** mechanism of actions, side effects and precautions to be taken.

**Gastro-intestinal system**

Classification of drugs used in Acid peptic diseases, pharmacotherapy of peptic ulcer, their mechanism of actions, adverse drug reactions, contra-indications and precautions.

**Antiemetic agents:** mechanism of actions, uses, side effects.

Pharmacological basis of use of drugs in diarrhea, ORS.

Drugs used in ulcerative colitis.

Drugs used in constipation, their limitations and hazards of their use.

Appetite stimulants, drugs used in obesity.

Drugs for biliary and pancreatic disease.

**Drugs acting on Endocrine System**

Anterior Pituitary and Posterior Pituitary hormones, melatonin

**Thyroid hormones and antithyroid drugs:** Pharmacological actions, indications, contraindications and side effects.

Drugs used for pharmacotherapy of diabetes mellitus, mechanism of actions, contraindications, precautions during the use and side effects. Management of iatrogenic hypoglycaemia and diabetic ketoacidosis

Sex hormones, their analogues and antagonists, uses in replacements and pharmacotherapy, outlining the rational for such use, contraindications and side effects

Pharmacological approaches to contraception, side effects, precautions during use and contraindications

Uterine relaxants, and uterine stimulants, indications, side effects, contraindications

Hormones of adrenal cortex, their synthetic analogues, pharmacological actions, therapeutic uses, precautions, side effects and contraindications

Hormones and drugs affecting calcium metabolism, therapeutic indications, contraindications and side effects

Drugs used in the treatment of infertility

**Chemotherapy**

General principals of chemotherapy, classification of chemotherapeutic agents, rational use of antimicrobial agents, indications for prophylactic and combined uses of antimicrobials

Chemotherapeutic agents: penicillins, cephalosporins, other β-lactams, β-lactamase inhibitors, aminoglycosides, broad spectrum antimicrobial agents, quinolones, sulphonamides, Macrolides and other newer drugs; their mechanism of actions, side effects, indications, resistance, drug interactions

Antiseptics, disinfectants and their use based on their pharmacological properties

Anticancer drugs, mechanism of actions, indications, side effects, contraindications, precautions

**Toxicology**

General principles of treatment of poisoning including snake bite and animal stings.

Heavy metal poisoning and heavy metal antagonists

Management of over dosage with commonly used therapeutic agents

**Miscellaneous**
Vaccines, Drugs modulating Immune system
Vitamins

Part II (Clinical Pharmacology and Therapeutics)

National Health programmes like:

1. Tuberculosis
2. Leprosy
3. HIV and STD
4. Malaria
5. Syphilis and gonorrhea
6. RCH programme
7. Upper and lower respiratory infections
8. Diarrhea
9. Filariasis
10. Anaemia
11. Diabetes Mellitis

Infective / Parasitic conditions

1. Influenza
2. Urinary Tract infections
3. Typhoid and other GIT infections
4. Amoebiasis, other protozoal infections
5. Worm infestations
6. Fungal infestations

Other topics:

1. Treatment of pain
2. Treatment of insomnia
3. Treatment of cough
4. Treatment of fever of unknown origin (PUO)
5. Drugs used in labour
6. I.V. fluids
7. Clinical uses of glucocorticoids
8. P-drug or how to select a drug for a given patient in a given situation
9. Essential drugs
10. Drug therapy in special situations (pregnancy, lactation, children, geriatrics, renal and hepatic diseases)

SKILLS:

Able to do independently

1. Dosage forms
   Oral
   Parenteral
   Topical & Others
2. Routes of drug administration, setting up an intravenous drip
3. Calculation of drug dosage
4. Sources of drug information – how to retrieve information
5. ADR monitoring
6. Therapeutic Drug Monitoring
7. Critical appraisal of drug promotional literature
8. Essentials of Clinical trials
9. Communicating to patients on the proper use of medication
10. Selection of P drug
11. Prescription writing, prescription auditing and standard treatment protocols
12. Essential drugs list
Teaching – Learning Methods:
The following objectives will be covered using theory lectures,
Small group discussions, simulated clinical case discussions, therapeutic auditing, problem based learning, e-learning and any other teaching learning method which the teacher chooses to select. An overlap between theory and practical classes will serve to reinforce and complement the two. Points not covered in theory can be covered during practical classes.

Suggested areas for integrated teaching in Pharmacology are as follows:

1. Hypertension
2. Glaucoma
3. Myasthenia gravis
4. Tuberculosis
5. HIV infection & AIDS
6. Peptic ulcer
7. Toxicology
8. Vaccines
9. Diabetes
10. Nutritional deficiencies, Anemia
11. Parochial asthma
12. PUO
13. Pain
14. Insomnia

Recommended books for undergraduates
1) Basic and Clinical Pharmacology Lange publications by Bertram G Katzung
2) Pharmacology by H P Rang, M M Dale, J M Ritter, P K Morore
3) Principles of Pharmacology by H L Sharma, K K Sharma
4) Essentials of Medical Pharmacology K D Tripathi
5) Pharmacology and Pharmacotherapeutics – By Goodman & Gilman (reference)

At the end of practicals the students should acquire the following skills and knowledge:

1. Appreciate the effects of mydriatics, miotics and local anesthetics on the eye.
2. Be able to instill correctly eye drops, measure pupillary diameter, test for light and corneal reflex.
3. Recognise the effects of general anesthesia in the rat.
4. Evaluate the effects of skeletal muscle relaxants, e.g. diazepam using the rota rod or an inclined plane on the mouse.
5. Appreciate the extrapyramidal side effects of antipsychotics in mouse (catatonia).
6. Evaluate the analgesic effects of NSAIDs and opioids on the rat using the tail-clip method.
7. Write a prescription for common diseases in the proper format. Write a prescription for elderly, children, in pregnant and lactating women.
8. Audit a given prescription.
10. Criticize and evaluate pharmaceutical company’s literature.
11. Calculate doses of commonly used drugs according to age.
12. Recognise signs and symptoms of common drug over dosage and poisons and
13. Calculate the cost-effectiveness of various drug regimen for common illness.

**Notified tests including send-up: Total 6**

1. Mid Semester Test One – Middle of third semester
2. End of third semester Test
3. Mid Semester Test Two - Middle of fourth semester
4. End of fourth semester Test
5. Mid semester Test Three – Middle of fifth semester
6. End of fifth semester - Send-up Examination

The three End semester test should be based on the university exam pattern with theory, practical and oral examinations.

The three mid-term tests may be based on Multiple Choice Questions, Short Structured theory test, OSPE, or even Orals. Multiple Choice Questions are to be encouraged in the formative assessments as much as possible.

For the calculation of internal assessment for theory, the average marks secured by the candidate in all the tests including the send-ups minus one test with the lowest score (n-1) will be taken.

For the calculation of internal assessment for practical, the average marks secured by the candidate in all the tests including the send-ups minus one test with the lowest score (n-1) will be taken.

A candidate has to secure at least 35% or more in the internal assessment for theory and practical to be eligible for appearing in the final examination.

Criteria for appearing in the University Examination:
75 % attendance in the subject. No condonation will be allowed below this limit.
35% marks in internal assessment for both theory and practicals.
FORENSIC MEDICINE
Learning Objectives

At the end of the course in Forensic Medicine, the learner shall be able to:

1. Identify, examine and prepare report or certificate in medico-legal cases / situations in accordance with the law of land.
2. Perform medico-legal postmortem examination and interpret autopsy findings and results of other relevant investigations to logically conclude the cause, manner and time since death.
3. Be conversant with medical ethics, etiquette, duties, rights, medical negligence and legal responsibilities of the physicians towards patients, profession, society, state and humanity at large.
4. Be aware of relevant legal / court procedures applicable to the medico-legal / medical practice.
5. Preserve and dispatch specimens in medico-legal / post mortem cases and other concerned materials to the appropriate Government agencies for necessary examination.
6. Manage medico-legal implications, diagnosis and principles of therapy of common poisons.
7. Be aware of general principles of environmental, occupational and preventive aspects of toxicology.

Course contents

Forensic Medicine (Forensic Pathology)

1. Definition of Forensic Medicine and Medical Jurisprudence.
2. Courts in India and their powers: Supreme Court, High Court, Sessions Court, Additional Sessions Court, Magistrate’s Courts.
3. Court procedures: Summons, conduct money, oath, affirmation, perjury, types of witnesses, recording of evidence, conduct of doctor in witness box.
4. Medical certification and medico-legal reports including dying declaration.
5. Death:
   a) Definition, types; somatic, cellular and brain – death.
   b) Natural and unnatural deaths.
   c) Suspended animation.
6. Change after death:
   a) Cooling of body, lividity, rigor mortis, cadaveric spasm, cold stiffening and heat stiffening.
   b) Putrefaction, mummification, adipocere and maceration.
   c) Estimation of time of death.
7. Inquest: Inquest by police, magistrate.
8. Identification:
   a) Definition,
   b) Identification of unknown person, dead bodies and remains of a person by age, sex, stature, dental examination, scars, moles, tattoos, dactylography, DNA typing and personal belonging including photographs.
9. Exhumation. (Desirable to know)
10. Medico-legal autopsies:
    a) Definitions of medico-legal and clinical/pathological autopsies.
    b) Objectives, procedures, formalities of medico-legal autopsies.
    c) Preservation of articles of importance, during autopsy.
    d) Preservation of body fluids & viscera in suspected poisoning.
11. Mechanical injuries or wounds:
a) Definition, classification of mechanical injuries; description of blunt force, sharp force and firearm injuries.
b) Medico-legal aspects of injuries, differences between antemortem and post-mortem injuries, estimation of age of different types of injuries, defence injuries, hesitation cuts; fabricated injuries; simple and grievous hurt, suicidal/accidental/homicidal injuries; causes of death by mechanical injuries.
13. Injuries due to physical agents, and their medico-legal importance; cold, heat, electricity and lightning, explosions and radioactive substances.
15. Deaths due to starvation.
19. Biological fluids:
   a) Blood – Preservation, dispatch of samples, importance of blood group in disputed paternity, hazards of blood transfusion.
   b) Seminal stains – Preservation and dispatch of samples.

FORENSIC PSYCHIATRY

1. Definition and brief overview of common mental illnesses.
2. True and feigned mental illness.
3. Civil and criminal responsibilities of a mentally ill person.
4. Indian Mental Health Act, 1987 with special reference to admission, care and discharge of a mentally ill person. (Desirable to know)

MEDICAL JURISPRUDENCE

1. Indian Medical Council and State Medical Councils; their functions and disciplinary control.
2. Rights and privileges and duties of a registered medical practitioner, Disciplinary proceedings and penal erasure.
3. Professional conduct, Etiquette and Ethics in medical practice.
4. Professional secrecy, privileged communication.
5. Medical Negligence: civil and criminal negligence, contributory negligence, vicarious liability, res ipsa loquitur, prevention of medical negligence and defences in medical negligence suits.
6. Consent: Types, informed consent, age in relation to consent, consent in relation to mental illness and alcohol intoxication, emergency and consent.
7. The Pre-natal Diagnostic Techniques Act (Prohibition of sex selection).
10. Certification of births, deaths, illness and fitness.

TOXICOLOGY

1. General aspects of poisoning: Duties of doctor in cases of poisoning, medico-legal autopsy in poisoning, preservation and dispatch of viscera for chemical analysis. Role of Forensic Science Laboratory in brief.

2. Types of poisons, diagnosis, principles of therapy and medicolegal aspects of:
   a) Corrosive poisons: strong mineral acids and organic acids.
   b) Metallic poisons: Lead, Arsenic, Mercury and Copper.
   c) Animal poisons: Snake and scorpion bites.
   d) Delirants: Datura, Cannabis and Cocaine.
   e) Somniferous agents: Opium, Morphine and other opioids.
   f) Inebriants: Methyl and ethyl alcohol.
   g) Asphyxiant poisons: Carbon monoxide, Carbon dioxide, Methane and cyanides.
   h) Anesthetic agents. (Desirable to know)
   i) Cardiac poisons: Cerebra thevetia and Nerium odorum.
   j) Miscellaneous: Aspirin, paracetamol, barbiturates, diazepam, antihistaminics, antidepressants and kerosene oil.
   k) Insecticides: Organophosphorus compounds, Carbamates and Organochloro compounds.
   l) Food poisoning.
   m) Drug abuse and dependence.

Desirable to know following poisonings:
   a) Inorganic non metallic poisons: Phosphorous.
   b) Organic vegetable irritants: Abrus precatorious, Capsicum, Calotropis, Semicarpus anacardium, Croton.
   c) Cardiac Poisons: Aconite.
   d) Convulsants: Strychnine.
   e) Paralytic agents, Curare.
   f) War gases and Industrial gases.
   g) Chloral hydrate.
   h) Mechanical poisons.

SKILLS

Able to perform independently under guidance.
1. Prepare proper certificates of birth and death.
2. Diagnose and manage common acute and chronic poisonings.
3. Age estimation from bones, x-rays and dentition (mock exercise).
4. Examination of injuries, weapons and report writing (mock exercise).
5. Examination of an alcohol intoxicated person and report writing (mock exercise).

Able to Assist
1. Prepare dying declaration.
2. Give evidence in a court of law as an expert witness.
3. Collect and do proper labeling, preservation and dispatch of medicolegal specimens.
4. Perform the medico-legal duties in case of poisoning.
5. Examination of victim and accused in sexual offences and report writing. (mock exercise).
7. Study of wet specimens.

Observe
1. Observing of ten medico-legal autopsies and enter the reports in practical record.
**Suggested topics for e-learning:**
1. Examination of an injured patient and report writing.
2. Examination of victim of sexual assault and report writing.

**Suggested topics for integrated teaching**
1. Death and dying
2. Organ transplant
3. Poisoning
4. Ethical & Medico legal issues in clinical practices
5. Child abuse
6. HIV/AIDS
7. Alcoholism

**METHOD OF ASSESSMENT:**
Modified essay question, Microscopic examination, Short answer questions, MCQs, Problem solving exercises, OSPE, Records Review, Checklist and Structured Oral Viva Voce

**TEACHING LEARNING METHODS:**
Structured interactive sessions, Small group discussion. Practical including demonstrations, Problem based exercises, Video clips, Written case scenario, Self learning tools, Interactive learning and e-modules

**TIME OF EVALUATION:**
There should be regular formative assessment. Formative assessment, day-to-day performance should be given greater importance. Examination of Forensic Medicine & Toxicology should be at the end of 5th semester and formative assessment in the middle of 3rd, 4th and 5th semester and summative assessment at the end of 5th semester.

**LEARNING RESOURCE MATERIALS**
Text books, Reference books, Practical note books, Internet resources, Video films etc.

**Suggested Textbooks for Forensic Medicine & Toxicology**
5. The essentials of Forensic Medicine & Toxicology by Dr. K.S. Narayanareddy- Latest edition

**Reference Books:**

**Internet:**
1. Journal of Indian Congress of Forensic Medicine & Toxicology at www.icfmt.org/

**OBJECTIVE FOR PRACTICAL EXAMINATIONS**
1. The students at the end of the day should be well versed with the practical aspects in the trauma center and the Hospital.
2. The duty of issuing of the different certificates like drunkenness, sexual assault, age, injury etc.
3. Intimation to the police of all types of medicolegal cases.
4. Conducting autopsy on the foetus and opining its age.
5. Conducting medicolegal autopsies and arriving at an opinion.
6. What viscerae to be collected in a case of poisoning. How to pack them. What is chain of custody.
7. Should have knowledge of the common poisons which are abused and should be able to identify them.
8. Should be able to examine a weapon and comment on what type of injuries it can cause and whether the injuries at post mortem are the injuries caused by this weapon.
9. Examine Skeletal remains and opine regarding it.
10. Examining X’rays to determine the age of an individual and certifying.
11. Appliances and instruments for treating a case of poisoning and instruments for performing a medicolegal autopsy.
12. Identify Soft specimens pathological and caused by trauma.

**OSPE’s**

1. Injury certificate.
2. Age Certification.
3. Drunkenness Certification.
4. Examination of Accused and Potency certification in a case of sexual assault /Examination of the Victim in a case of sexual assault.
5. Age & Sex determination from bones with reasons.
6. Age determination from X-ray with reasons.
7. Death certificate.
8. Interpretation of the autopsy reports.

**SHORT OSPE’S**

1. Wet specimen
2. Weapon.
3. Photograph.
4. Poison.
5. Appliance/Autopsy instrument
6. Medical sickness and fitness from medical leave certificate.
7. Viscera Packing.
8. Interpretation of the age of foetus.

**Notified tests including send-up: Total 6**

1. Mid Semester Test One – Middle of third semester
2. End of third semester Test
3. Mid Semester Test Two - Middle of fourth semester
4. End of fourth semester Test
5. Mid semester Test Three – Middle of fifth semester
6. End of fifth semester - Send-up Examination

The three End semester test should be based on the university exam pattern with theory, practical and oral examinations.
The three mid-term tests may be based on Multiple Choice Questions, Short Structured theory test, OSPE, or even Orals. Multiple Choice Questions are to be encouraged in the formative assessments as much as possible.
For the calculation of internal assessment for theory, the average marks secured by the candidate in all the tests including the send-ups minus one test with the lowest score (n-1) will be taken.
For the calculation of internal assessment for practical, the average marks secured by the candidate in all the tests including the send-ups minus one test with the lowest score (n-1) will be taken.
A candidate has to secure at least 35% or more in the internal assessment for theory and practical to be eligible for appearing in the final examination.
Criteria for appearing in the University Examination:
75% attendance in the subject. No condonation will be allowed below this limit.
35% marks in internal assessment for both theory and practicals.
COMMUNITY MEDICINE INCLUDING HUMANITIES
COMMUNITY MEDICINE INCLUDING HUMANITIES

DEPARTMENTAL OBJECTIVES:

By the completion of training, the student shall be able to:

1) Appreciate the physical, social, psychological, economic and environmental aspects of health and disease.
2) Apply the clinical skills to recognize and manage common health problems including their physical, emotional and social aspects at the individual and family levels and deal with medical emergencies at the community level.
3) Define and manage the health problems of the community he/she serves. To achieve this, the student will be able to:
   a) Organize elementary epidemiological studies to assess the health problems in the area. For this, he should be able to design a study, collect data, analyze it with statistical tests and make a report and participate in a health information system.
   b) Prioritize the most important problems and help formulate a plan of action to manage them under National Health Programme guidelines including population control and family welfare programme. He should be able to assess and allocate resources and implement and evaluate programmes.
   c) Organize prevention and control of communicable and non-communicable diseases.
   d) Organize health care services for special groups like mothers, infants, under-five children and school children.
   e) Organize health care in case of calamities.
4) a) Work as an effective member of the health team;
   b) Coordinate with and supervise other members of the health team and maintain liaison with other agencies.
5) Plan and implement health education programmes.
6) Perform administrative functions of health centers.
7) Promote community participation especially in areas of disease control, health education and implementation of national programmes.
8) Appreciate his/her limitations, recognize situations calling for referral to higher centers and be willing to refer patients for further consultations at the appropriate moment to appropriate centers.

COURSE CONTENT

I Concepts in Health:

Must know:
1. Definition of health; appreciation of health as a relative concept; determinants of health.
2. Characteristics of agent, host and environmental factors in health and disease and the multifactorial etiology of disease.
3. Understanding of various levels of prevention with appropriate examples.
4. Indices used in measurement of health.
5. Health situation in India - especially the demography, mortality and morbidity profile and the existing health facilities in health services.

Desirable to know:
1. Difficulties in measurement of health.

II Epidemiology:

Must know:
1. Use of basic epidemiological tools to make a community diagnosis of the health situation in order to formulate appropriate intervention measures.
2. Epidemiology; definition, concepts and its role in health and disease.
3. Definition of the terms used in describing disease, transmission and control.
5. Modes of transmission and measures for prevention and control of communicable and non-communicable diseases.
6. Principal sources of epidemiological data.
7. Definition, calculation and interpretation of the measures of frequency of diseases and mortality.
8. Common sampling techniques, simple statistical methods for the analysis, interpretation and presentation of data, frequency distribution, measures of central tendency, measures of variability.
9. Need and uses of screening tests.
10. Accuracy and clinical value of diagnostic and screening tests (sensitivity, specificity, predictive values).
11. Planning, collecting, analyzing and interpreting data to reach a community diagnosis.
12. Epidemiology of communicable and non-communicable diseases of public health importance and their control.
13. Epidemiologic basis of national health programmes.
15. a) Planning and investigation of an epidemic of a communicable disease in a community setting.
   b) Institution of control measures and evaluation of the effectiveness of these measures.

Desirable to know:
1. Various types of epidemiological study designs.
2. The derivation of normal values and the criteria for intervention in case of abnormal values.
3. Planning an intervention programme with community participation based on the community diagnosis.
4. Applications of computers in epidemiology.

III. Epidemiology of specific diseases (Communicable & non-communicable diseases):

The specific objectives of selected communicable diseases of public health importance for which National Disease Control/Eradication Programmes have been formulated are described here.

For the rest of the diseases, the individual teacher would formulate the objectives while drawing the lesson plans. The idea of formulating objectives for a few diseases is to highlight their importance and to emphasis certain learning outcomes.

Must know:
1. Extent of the problem, epidemiology and natural history of the disease.
2. Relative public health importance of a particular disease in a given area.
3. Influence of social, cultural and ecological factors on the epidemiology of the diseases.
4. Control of communicable and non-communicable diseases by:
   a) Diagnosing and treating a case and in doing so demonstrate skills in:
      i) Clinical methods.
      ii) Use of essential laboratory techniques.
      iii) Selection of appropriate treatment regimes.
      iv) Follow-up of cases.
   b) Principles of planning, implementing and evaluating control measures for the diseases at the community level bearing in mind the relative importance of the diseases.
5. Institution of programmes for the education of individuals and communities.
7. Awareness of the National diseases Control Programmes.
Desirable to know:
1. Level of awareness, causation and prevention of disease among individuals and communities.
2. Control of communicable and non-communicable diseases by diagnosing and treating a case and in doing so demonstrate skills in:
3. Understand the principles of measures to control a disease epidemic.
4. Training health workers in (i) disease surveillance, (ii) control and treatment, (iii) health education.
5. Managerial skills in the areas of (i) supervision, (ii) collection and compilation of data, (iii) maintenance of records, (iv) transmission of data.

In addition to the above, the student should have the following additional skills for each disease:

Theses are general principles which are applicable to all the communicable and non-communicable diseases/conditions.

Though the list of diseases is quite long, here are names of some important communicable and non-communicable diseases/conditions which need to be taught. Needless to say, the emphasis on these diseases/conditions will vary from place to place. They are: Poliomyelitis, Infective hepatitis, ARI, T.B., Malaria, Filariasis, STDs and AIDS, Diarrhoeal diseases, Kala Azar, Mental health, Coronary heart disease, Blindness, Hypertension, Leprosy.

IV. Biostatistics:

Must know:
   a) The scope and uses of biostatistics.
   b) Collection, classification and presentation of statistical data.
   c) Analysis and interpretation of data.

2. Obtaining information, computing indices (rates and ratio) and making comparisons.

Desirable to know:
1. Apply statistical methods in designing controls
   a) choosing of appropriate controls
   b) applying tests of significance
   c) use of statistical tables.

V. Entomology:

Must know:
1. Role of vectors in the causation of diseases.
2. Steps of management of a case of insecticide toxicity.

Desirable to know:
1. Identifying features of and mode of transmission of vector borne diseases.
2. Methods of vector control with advantages and limitations of each
3. Mode of action, dose and application cycle of commonly used insecticides.

VI. Environmental Studies and Sanitation:

Must know:
   a) Awareness of the concept of safe and wholesome water.
   b) Awareness of the requirements of a sanitary source of water.
   c) Understanding the methods of purification of water on small scale with stress on chlorination of water.
   d) Various biological standards.
   e)
Note:

Desirable to know:
1. Physical, chemical standards; tests for assessing quality of water.
2. Disposal of solid waste, liquid waste, both in the context of urban and rural conditions in the country.
3. Problems in the disposal of refuse, sullage and sewage.
   a) Sources, health hazards and control of environmental pollution
   b) Influence of physical factors – like heart humidity, cold, radiation and noise – on the health of the individual and community.
   c) Standards of housing and the effect of poor housing on health.
   d) Large scale purification of water.

VII. Reproductive & Child Health (RCH):

Must know:
1. Need for specialized services.
2. Magnitude of morbidity and mortality in a given area.
3. Local customs and practices during pregnancy, child birth and lactation.
5. Under-5: morbidity, mortality, high risk and care of under-5
6. Monitoring of growth and development and use of Road to Health Chart.
7. Organisation, implementation and evaluation of programmes for mothers and children as per National Programme guidelines; supervising health personnel; maintaining records; performing nutritional assessment; promoting breast feeding.

Desirable to know:
Genetics and Community Health

VIII. Demography & Family Planning:

Must know:
1. Definition of demography and family welfare programme.
2. Stages of the demographic cycle and their impact on the population.
4. Reasons for rapid population growth in India.
5. Need for population control measures and the National Population Policy.
6. Identify and describe the different family planning methods and their advantages and shortcomings.
7. Demonstrate skills in motivating a couple for selecting an appropriate family planning method.

Desirable to know:
1. Organizational, technical and operational aspects of the National Family Welfare Programme and participate in the implementation of Programme.
2. Give guidance for MTP and infertility services.
3. Recent advances in contraception.

IX. Health Planning and Management:

Must know:
1. Explain the terms: public health, public health administration, regionalization, comprehensive medical care, delivery of health care, planning management, evaluation.
2. Components of health care delivery:
   i) Describe the salient features of the National Health Policy concerning:
II Explain the process of health planning in India by demonstrating awareness of:
the health systems and health infrastructure at centre, state and district levels.
the inter-relationship between community development block and primary health centre.
the organization, functions and staffing pattern of community health centers, primary health centers, rural health centre and sub-centre.
the job descriptions of health supervisor (male and female); health workers; village health guide; anganwadi workers traditional birth attendants.
the activities of the health team at the primary health centre.

Desirable to know:
1. Familiarity with management techniques: Define and explain principles of management; explain the three broad functions of management (planning, implementation and evaluation) and how they relate to each other.
2. The components of health care delivery:
   appreciate the need for International Health Regulations and Disease Surveillance.
   be aware of the constitutional provisions for health in India.
   enumerate the three major divisions of responsibilities and functions (concerning health) of the union and the state governments.
   explain the process of health planning in India by demonstrating awareness of recommendations of different health committees such as Bhore, Mudaliar, etc.
   appreciate the role of national, international voluntary agencies in health care delivery.
3. Explain the terms: cost-effectiveness, cost-benefit.

X. Nutrition:
Must know:
1. Common sources of various nutrients and special nutritional requirement according to age, sex, activity, physiological condition.
2. Nutritional assessment of individual, families and the community by selecting and using appropriate; methods such as: anthropometry, clinical, dietary, laboratory techniques.
3. Compare recommended allowances of individual and families with actual intake
4. Plan and recommend a suitable diet for individuals and families bearing in mind local availability of foods, economic status, etc.
5. Common nutritional disorders: PEM, Vit. A Deficiency, anemia, iodine deficiency disease, fluorosis, food toxin diseases and their control and management.

XI. Medical Sociology:
Must know:
1. Conduction of clinic-social evaluation of the individual in relation to social, economic and cultural aspects; educational residential background; attitude to health, disease and health services; the individual’s family and community.
2. Assessment of barriers to good health, recovery from sickness and to leading a socially and economically productive life.
4. Identification of social factors related to health and disease in the context of urban and rural societies.
5. Impact of urbanization of health and disease.

XII. School Health
Must know:
1. Objectives of the School Health Programme.
2. **Activities of the Programmes like:**
   a) Carrying out periodic medical examination of the school children and the teachers.
   b) Immunization of children
   c) Health education.
   d) Mid-day meals.

**Desirable to know:**
1. Obtaining participation of the teachers in the school health programme including maintenance of records; defining healthful practices; early detection of abnormalities.

**XIII. Occupational Health:**

**Must know:**
1. Relate the history of symptoms with the specific occupation including agriculture.
2. Employees State Insurance Scheme

**Desirable to know:**
1. Identification of the physical, chemical and biological hazards to which workers are exposed to while working in a specific occupational environment.
2. Diagnostic criteria of various occupational diseases.
3. To suggest preventive measures against these diseases including accident prevention.

**XIV. Health Education (Behavioral Change Communication - BCC):**

**Must know:**
1. Communicate effectively with the individuals, family and the community using tools and techniques of information, education, communication.
   a) Appreciate barriers to effective communication.
   b) Describe the principles and methods and evaluation of health education.
   c) List various methods of health education with their advantages and disadvantages.
   d) Select and use appropriate media (simple audio-visual aids) for effective health education.

2. Use every opportunity for health education of the individual, family and the community

**XV. Urban Health:**

**Must know:**
1. Common health problems (medical, social, environmental, economic, psychological) of urban slum dwellers.
2. Organisation of health services for slum dwellers.
3. Organisation of health services in urban areas.

**SKILLS**

**Part I: GENERAL SKILLS:**

The student should be able to:
1. Elicit the clinico-social history to describe the agent, host and environmental factors that determine and influence health.
2. Recognize and assist in management of common health problems of the community.
3. Apply elementary principles of epidemiology in carrying out simple epidemiological studies in the community.
4. Work as a team member in rendering health care.
5. Carry out health education effectively for the community.

Part II: SKILLS IN RELATION TO SPECIFIC TOPICS:

1. Communication
The student should be able to communicate effectively with family members at home, patients at clinics or at homes; individuals, family or a group for health education, peers at scientific forums.

2. Team activity
Work as a member of the health team; in planning and carrying out field work like school health.

3. Environmental sanitation
Collect water samples for microbiological evaluation; chlorination of water; estimate the chlorine demand of water; estimate the residual chlorine of water. Insecticides - their proper storage and use in control of vectors.

4. Communicable and non-communicable diseases (including social problems)
   a) Eliciting clinical- social history and examining the patient for diagnosis and treatment.
   b) Collection of appropriate material for microbiological, pathological or biochemical tests.
   c) Fixing and staining and examining smears - peripheral blood smear for malaria and filariasis; sputum for AFB; slit skin smears for leprosy; Hb estimation; urine and stool examination.
   d) Assessing the severity and/ or classifying dehydration in diarrhea, upper respiratory tract infection, dog bite, leprosy.
   e) Adequate and appropriate treatment and follow-up of leprosy, malaria, filariasis, rabies, upper respiratory tract infection, diarrhea and dehydration.
   f) Advice on the prevention and prophylaxis of common diseases - vaccine preventable diseases, tetanus, malaria, filariasis, rabies, cholera, typhoid, intestinal parasites.
   g) Use of proper screening methods in early diagnosis of common diseases.
   h) Take necessary steps in disease outbreak/ epidemics/ natural disasters - investigation of epidemic, food poisoning; notification; organizing medical care following disasters.

5. Maternal and Child Health
   a) Antenatal - examination of the mother; application of the risk approach in antenatal care.
   b) Intrapartum - conduction a normal delivery; early recognition of danger in intrapartum period; referral of cases requiring special care.
   c) Postnatal - assessment of the mother and newborn; advice on appropriate family planning method; promotion of breast feeding; advice on weaning.
   d) Assessment of growth and development of the child - use of the 'Road to Health' card; recording important anthropometric assessments of the child; giving immunization to the child; identifying high risk infants.

6. Statistics
   a) Take proper sample.
   b) Apply appropriate tests of significance to make a correct inference.
   c) Simple analysis and presentation of data.

7. Nutrition
   a) Conducting a diet survey.
b) Community survey and clinical diagnosis of nutritional deficiencies; vitamin A deficiency, iodine deficiency, malnutrition.
c) Making recommendations regarding diet.

8. Occupational Health
a) Inspection of work sites.
b) Recommendation in improving work sites.
c) Medical examination of workers.

9. Health Care of the Community
a) Ensuring community participation in health care.
b) Arranging intersectoral coordination where necessary.
c) Working in liaison with other agencies involved in health care in various National Health Programmes.

10. Health Management
a) Be an effective team leader.
b) Guide and train workers.
c) Supervision of workers and Programmes.

11. Family Planning: Advice on appropriate methods.
12. Managerial: Organise antenatal and under - five clinic.

AREAS FOR INTEGRATED TEACHING

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<thead>
<tr>
<th>Sl. no</th>
<th>Area</th>
<th>Collaborating Departments</th>
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<tbody>
<tr>
<td>1.</td>
<td>Growth and development in children</td>
<td>Anatomy and Paediatrics</td>
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<td>&lt; 5 years</td>
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<td>2.</td>
<td>Acute diarrhoeal diseases</td>
<td>Physiology and Paediatrics</td>
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<td>3.</td>
<td>Disaster preparedness</td>
<td>Anesthesiology</td>
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<td>4.</td>
<td>Maternal and child health and</td>
<td>Obstetrics &amp; Gynecology and Paediatrics</td>
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<td>Family Planning</td>
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<td>5.</td>
<td>Surveillance of vaccine preventable</td>
<td>Dept. of Health, Govt. of Pondicherry</td>
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<td>Diseases</td>
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45 hours for the environmental studies in UG Curriculum have to be incorporated by the Community Medicine Department in their teaching schedule.
OPHTHALMOLOGY
OPHTHALMOLOGY

Introduction

Anatomy of the eye – including visual pathway, Extraocular muscles

Physiology – Aqueous humour formation, tear film, fields

Pharmacology – Ophthalmic preparations, modes of administration, Antibiotics, antivirals, antifungals, antiglaucoma drugs, mydriatics and cycloplegics, ocular toxicity of systemic, ocular medication.

Elementary Optics: Strum’s conoid, donders eye

Diseases of the eye

CONJUNCTIVA

Must know
Acute Conjunctivitis, Trachoma, Allergic conjunctivitis, Pinguecula, Peterygium, Xerosis/bitot spots.

Desirable to know
Cheonic conjunctivitis, Dry eye, Membranous conjunctivitis, Inclusion conjunctivitis.

CORNEA

Must know
Corneal inflammations: Corneal Ulcers – bacterial, fungal, viral
Vitamin A Deficiency and keratomalacia
Exposure keratitis, Neuroparalytic keratitis
Corneal blindness, Eye banking, eye donation, keratoplasty Arcus senilis

Desirable:
Deep/Interstital keratitis, Degenerations and dystrophies, Overview of Keratorefractive surgery.

SCLERA

Must know:
Scleritis, episcleritis.

UVEAL TRACT

Must know:
Iridocyclitis, Panophthalmitis, Endophthalmitis

Desirable to know:
Systemic associations of uveitis, Choroiditis, Coloboma iris

LENS

Must know:
Age related cataract and it management, Congenital Cataract, Awareness of amblyopia, Diabetic Cataract, Cataract Surgery

Desirable to know:
Other forms of cataract: complicated cataract, Metabolic, traumatic, toxic, posterior capsular opacification

Vitreous

Must know:
Vitreous hemorrhage – causes

Desirable to know:
SYnchisis syntillans, Asteroid hyalosis

Glaucomas

Must know:
Angle Closure glaucoma, Open angle glaucoma, Steroid glaucoma

Desirable to know:
Secondary glaucomas, Congenital glaucoma

Retina

Must know:
Fundus changes in Diabetes, Hypertension, Pregnancy induced hypertension, Hematological disorders, Myopia.

: Photocoagulation

: Retinal Vascular diseases – Central retinal occlusion, Central retinal vein occlusion

Desirable to know:
Retinopathy of prematurity, Retinitis pigmentosa, retinoblastoma

Optic Nerve

Must know:
Papilledema, Optic neuritis, Optic atrophy.

Squint

Must know:
Awareness of amblyopia, Types of squint (Paralytic, Non paralytic)

Orbit

Must know:
Common causes of proptosis, Orbital cellulites, Cavernous sinus thrombosis

Lacrimal System

Must know:
Dacryocystitis – Congenital, Acute, Chronic. Dry eye

Lids

Must know:
Inflammations, ectropion entropion, trichiasis, ptois, lagophthalmos, symblepharon

Refractive Errors

Must know:
Myopia, hypermetropia, Astigmatism, Presbyopia aphakia/pseuophakia, Anisometropia
INJURIES:

**Must know:**
Chemical injuries and first aid treatment, Open globe injuries, closed globe injuries.

**Desirable to know:**
Siderosis bulbi, Chalcosis, medico legal aspects

OPHTHALMIC SURGERY

**Must observe** cataract surgery, enucleation, trabeculectomy, pterygium surgery

**Desirable to watch:**
Keratoplasty.

COMMUNITY OPHTHALMOLOGY

**Must Know**
Definition and types of blindness.
- Causes of blindness
- Promotion of eye donation
- NPCB, Vision 2020, Eye camps

MISCELLANEOUS

**Must Know**
Symptomatic disturbances of vision
Overview of Recent Advances in Ophthalmology

**Desirable to know:**
Lasers in Ophthalmology.
OTO-RHINO-LARYNGOLOGY (E.N.T.)
OTO-RHINO-LARYNGOLOGY (E.N.T.)

Must know:

1. Anatomy of External, Middle and Inner Ear.
2. Physiology of hearing and equilibrium.
3. Anatomy and Physiology of Nose and Para nasal Sinuses.
5. Anatomy of Larynx and Physiology of Phonation.

EAR DISEASES

EXTERNAL EAR

Must know:
Wax, Perichondritis, Otitis Externa, Furuncle, Otomycosis, Foreign bodies, Otalgia

Desirable to know:
Malignant Otitis externa, Pre auricular Sinus.

MIDDLE EAR

Must know:
Acute Otitis media, chronic otitis media – safe and unsafe, Otitis media with effusion complications of CSOM, Facial palsy, Otosclerosis, Myringoplasty, Conductive deafness.

Desirable to know:
Tympanoplasty

DISEASES OF INNER EAR

Must know:
Menieres disease, Sensorineural deafness, Deaf child, Hearing aid, Vertigo, Tinnitus and Ototoxicity.

Desirable to know:
Rehabilitation of the hearing impaired, Acoustic neuroma. Cochlear implant.

NOSE AND PARANASAL SINUSES

DISEASES OF THE NOSE AND PARANASAL SINUSES:

Must know:
Vestibulitis, Deviated nasal septum, Septal hematoma, Septal abcess, Nasal polyposis, Epistaxis, AtrophicRhinitis, Nasopharyngeal angiofibroma, Acute and Chronic sinusitis, complications of Sinusitis, Foreign bodies in the nose, CSF Rhinorrhoea, Allergic Rhinitis and Rhinosporidiosis.

Desirable to know:
Fracture nasal bones, maxilla and Wegener’s granuloma.

DISEASES OF ORAL CAVITY & OROPHARYNX

Tonsillitis Acute and Chronic, Quinsy, Leukoplakia, erythroplakia, Maligancy of tongue, tongue tie, Submucus fibrosis. Adenoid, Acute chronic Pharyngitis and Retropharyngeal abscess.
Desirable to know:
Malignancy of nasopharynx and Para Pharyngeal abscess.

**DISEASES OF LARYNX AND TRACHEA**

Must know:
Stridor, Voice and Speech disorders, foreign bodies in air passages, Malignancy of Larynx, Laryngotracheal trauma, Acute and Chronic inflammations of larynx. Laryngeal paralysis. Puberphonia and Hysterical aphonia.

Desirable to know:
Congenital lesions of larynx, voice rehabilitation and Laryngeal stenosis.

**DISEASES OF OESOPHAGUS:**

Must know:
Dysphagia, Foreign bodies of food passages.

Desirable to know:
Disorders of Oesophagus
Hiatus hernia & pharyngeal pouch

**SURGERIES IN E N T**

Must observe:
Tonsillectomy
Adenoidectomy
Tracheostomy
Antral wash
Caldwell Luc Surgery
Anterior Nasal packing
Direct Laryngoscopy
Oesophagoscopy
Myeingoplasty
Mastoid surgery – Cortical & Modified Radical
**F E S S**

**COMMUNITY PROGRAMMES:**

1. Prevention of Deafness.
2. Detection of Congenital and Childhood deafness.
3. Hearing Rehabilitation.

**X-RAYS**

1. X-Ray Soft tissue neck lateral view.
2. X-Ray PNS water’s view.

**INSTRUMENTS**

1. Eves tonsillar Snare.
2. Boyle Davis mouth gag.
3. Tracheostomy tubes
   Jackson & Fuller’s
5. Tilley lichwitz trochar and cannula.
6. Luc’s forceps.
7. Ballenger’s Swivel knife.
8. Bronchoscope
10. Laryngoscope.
11. Tracheal dilator
12. Mollisons self retaining mastoid retracter
13. Pillar retracter and dissector
MEDICINE
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;
(2) MEDICINE:

Objectives:

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

1. Elicit clinical history, perform thorough physical examination, elicit physical signs, interpret findings, develop differential diagnoses and request relevant laboratory investigations.
2. Diagnose common clinical disorders with special reference to infectious diseases, nutritional disorders, lifestyle diseases, tropical and environmental diseases.
3. Plan relevant diagnostic and investigative procedures and be able to interpret them.
4. Outline the principles of management and prevention of common health problems affecting the community.
5. Plan and write prescription for comprehensive treatment using the principles of rational drug therapy.
6. Provide first level care for common medical conditions and emergencies and recognize the timing and level of referral, if required.
7. Perform essential bedside procedures like venepuncture, SC and IM injections, biological fluid examinations.
8. Assist common bedside procedures like pleural aspiration, bone marrow aspiration and biopsy, lumbar puncture etc.
10. Develop an interest in the care for all types of patients.
11. Evaluate each patient as a person in society and not merely a collection of organ systems or symptoms and signs.
12. Discern the hopes and fears of patients, which underlie the symptom complexes and know how to handle these emotions, both in himself / herself and others.
13. Demonstrate skills in documentation of case details including epidemiological data.
14. Respect patients’ rights and privileges including patients’ right to information and right to seek a second opinion.
15. Demonstrate empathy and humane approach towards patients and their families and respect their sensibilities.
16. Demonstrate communication skills in interviewing patients, providing explanations...
to patients and families about the management and prognosis, providing counseling and giving health education messages to patients, families and communities.
17. Have an open attitude to the developments in Medicine so as to be aware of the need to keep abreast of new knowledge.
18. Learn and adopt new ideas and new situations where resources may be limited.
19. Comprehend, accept and manage the uncertainties in scientific knowledge and medical practice.
20. Understand the ethical and legal implications of his/her medical decisions.

### Course content

<table>
<thead>
<tr>
<th>Topics</th>
<th>Must know</th>
<th>Desirable to know</th>
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<tbody>
<tr>
<td><strong>1. Clinical Methods in the Practice of Medicine</strong>&lt;br&gt;Clinical approach to patients:</td>
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<tr>
<td>The art of medicine, doctor-patient relationship, communication skills, doctor's responsibilities</td>
<td>Yes</td>
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<tr>
<td><strong>Clinical approach to disease and care of patients:</strong></td>
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<tr>
<td>Clinical diagnostic reasoning i.e. diagnostic possibilities based on interpretation of history, physical findings and laboratory investigations</td>
<td>Yes</td>
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<tr>
<td><strong>Principles of rational management:</strong></td>
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<tr>
<td>keeping in mind the best evidence in favor of or against different remedial measures (EBM)</td>
<td>Yes</td>
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<tr>
<td><strong>2 Common Symptoms of Disease</strong></td>
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<tr>
<td>Pain: pathophysiology, clinical types, assessment and management</td>
<td>Yes</td>
<td></td>
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<td>Fever: clinical assessment and management</td>
<td>Yes</td>
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<tr>
<td>Cough, chest pain, dyspnoea, hemoptysis</td>
<td>Yes</td>
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<td>Edema, anasarca, ascites</td>
<td>Yes</td>
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<tr>
<td>Pallor, jaundice</td>
<td>Yes</td>
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<td>Bleeding</td>
<td>Yes</td>
<td></td>
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<tr>
<td>Anorexia, nausea and vomiting</td>
<td>Yes</td>
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<td>Constipation and diarrhea</td>
<td>Yes</td>
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<tr>
<td>Hematemesis, malena and hematochezia</td>
<td>Yes</td>
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<tr>
<td>Common urinary symptoms- dysuria, pyuria, anuria, oliguria, polyuria, nocturia, enuresis</td>
<td>Yes</td>
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<td>Body pains and joint pains</td>
<td>Yes</td>
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<tr>
<td>Headache, seizures, fainting, syncope, dizziness, vertigo</td>
<td>Yes</td>
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<tr>
<td>Disturbances of consciousness and coma</td>
<td>Yes</td>
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<td>Weight loss and weight gain</td>
<td>Yes</td>
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<tr>
<td>Clinical genetics – common types, clinical presentation, investigation and prevention of genetic diseases and genetic counseling</td>
<td>Yes</td>
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<td>Medial disorders and pregnancy</td>
<td>Yes</td>
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<td><strong>3 Nutrition and Nutritional Disorders</strong></td>
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<tr>
<td>Nutritional assessment &amp; needs</td>
<td>Yes</td>
<td></td>
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<tr>
<td>Protein energy malnutrition</td>
<td>Yes</td>
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<tr>
<td>Obesity</td>
<td>Yes</td>
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<td>Vitamin deficiency &amp; excess</td>
<td>Yes</td>
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<td>Mineral deficiency and excess</td>
<td>Yes</td>
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<tr>
<td>Diet therapy</td>
<td>Yes</td>
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<td><strong>4 Fluid, Electrolyte and Acid-base Imbalance</strong></td>
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<tr>
<td>Fluid and electrolyte balance; acidosis and alkalosis in particular relevance to diarrhea, vomiting, dehydration, uremia and diabetic ketoacidosis</td>
<td>Yes</td>
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<tr>
<td><strong>5 Poisonings, Stings and Bites</strong></td>
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<tr>
<td>General approach to the poisoned patient</td>
<td>Yes</td>
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</tbody>
</table>
Poisoning by specific pharmaceutical agents- organophosphorus compounds, methyl alcohol, narcotics, aluminium phosphide, sedatives / hypnotics, other poisonings common locally | Yes
---|---
Drugs of misuse | Yes
Snake bite and Envenomation | Yes
Other bites and stings – scorpion, spider | Yes
6 Specific Environmental and Occupation Hazards

<table>
<thead>
<tr>
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<th>Yes</th>
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<tbody>
<tr>
<td>Heatstroke and hypothermia</td>
<td>Yes</td>
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<td>Chemicals and pesticides</td>
<td>Yes</td>
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<tr>
<td>Drowning and near drowning</td>
<td>Yes</td>
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<tr>
<td>Electrical injuries</td>
<td>Yes</td>
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<tr>
<td>Radiation injury</td>
<td>Yes</td>
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<td>Heavy metal poisoning</td>
<td>Yes</td>
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7 Immune Response and Infections

<table>
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<tr>
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<th>Yes</th>
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<tbody>
<tr>
<td>Approach to infectious diseases – diagnostic and therapeutic principles</td>
<td>Yes</td>
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<tr>
<td>Immune defense mechanisms</td>
<td>Yes</td>
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<tr>
<td>Laboratory diagnosis of infections</td>
<td>Yes</td>
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<tr>
<td>Principles of immunization and vaccine use</td>
<td>Yes</td>
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<tr>
<td>Immunodeficiency disorders – acquired</td>
<td>Yes</td>
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<tr>
<td>Immunodeficiency disorders – congenital</td>
<td>Yes</td>
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<tr>
<td>Clinical syndromes – diagnostic and therapeutic approach</td>
<td>Yes</td>
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<tr>
<td>The febrile patient</td>
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<tr>
<td>Fever and rash</td>
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<tr>
<td>Fever of unknown origin</td>
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<tr>
<td>Infective endocarditis</td>
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<tr>
<td>Intra-abdominal infections and abscesses</td>
<td></td>
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<tr>
<td>Acute infectious diarrhoeal diseases and food poisoning</td>
<td></td>
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<tr>
<td>Sexually transmitted diseases – overview &amp; clinical approach</td>
<td></td>
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<tr>
<td>Infections of skin, muscle &amp; soft tissues</td>
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<tr>
<td>Osteomyelitis</td>
<td></td>
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<tr>
<td>Hospital acquired infections</td>
<td></td>
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<tr>
<td>Infections in immuno-compromised hosts</td>
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</tbody>
</table>
8 Specific Infections – Epidemiology, clinical features, laboratory diagnosis, rational use of antimicrobial therapy against the following and their prevention:

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
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</thead>
<tbody>
<tr>
<td>Protozoal infections</td>
<td></td>
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<tr>
<td>Amoebiasis, Giardiasis, Malaria, Leishmaniasis Trichomoniasis</td>
<td>Yes</td>
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<tr>
<td>Toxoplasmosis, Trypanosomiasis</td>
<td>Yes</td>
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<tr>
<td>Bacterial infections</td>
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<td>Common gram positive infections</td>
<td>Yes</td>
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<tr>
<td>Common gram-negative infections</td>
<td>Yes</td>
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<tr>
<td>Enteric fevers</td>
<td>Yes</td>
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<tr>
<td>Tetanus</td>
<td>Yes</td>
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<tr>
<td>Pertussis and diphtheria</td>
<td>Yes</td>
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<tr>
<td>Legionella infections</td>
<td>Yes</td>
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<tr>
<td>Botulism</td>
<td>Yes</td>
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<tr>
<td>Gas gangrene, other clostridia infections</td>
<td>Yes</td>
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<tr>
<td>Cholera</td>
<td>Yes</td>
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<tr>
<td>Shigellosis and bacillary dysentery</td>
<td>Yes</td>
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<tr>
<td>Brucellosis</td>
<td>Yes</td>
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<tr>
<td>Plague</td>
<td>Yes</td>
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<tr>
<td>Leptospirosis</td>
<td>Yes</td>
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<tr>
<td>Donovanosis (Granuloma inguinale)</td>
<td>Yes</td>
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<tr>
<td>Helicobacter Pylori</td>
<td>Yes</td>
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<tr>
<td>Infections due to pseudomonas &amp; other gram-negative bacteria</td>
<td>Yes</td>
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<tr>
<td>Anaerobic infections</td>
<td>Yes</td>
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<tr>
<td><strong>Mycobacterial diseases</strong></td>
<td></td>
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<tr>
<td>Tuberculosis</td>
<td>Yes</td>
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<tr>
<td>Leprosy</td>
<td>Yes</td>
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<tr>
<td><strong>Viral infections</strong></td>
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<tr>
<td>Common exanthemata e.g. Measles, mumps, rubella, varicella</td>
<td>Yes</td>
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<tr>
<td>Herpes simplex and herpes zoster</td>
<td>Yes</td>
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<tr>
<td>Influenza and other common viral respiratory infections</td>
<td>Yes</td>
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<tr>
<td>Human immunodeficiency virus (HIV)</td>
<td>Yes</td>
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<tr>
<td>Viral gastroenteritis</td>
<td>Yes</td>
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<tr>
<td>Dengue fever</td>
<td>Yes</td>
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<tr>
<td>Rabies</td>
<td>Yes</td>
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<tr>
<td>Viral encephalitis</td>
<td>Yes</td>
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<tr>
<td>Infectious mononucleosis</td>
<td>Yes</td>
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<tr>
<td>Rickettsia, Mycoplasma &amp; Chlamydia diseases</td>
<td>Yes</td>
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<tr>
<td>Infections in immunocompromised host</td>
<td>Yes</td>
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<tr>
<td><strong>Common fungal infections</strong></td>
<td></td>
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<tr>
<td>e.g. Candidiasis, Aspergillosis, Histoplasmosis, Cryptococcosis, Mucormycosis, Pneumocystis carinii.</td>
<td>Yes</td>
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<tr>
<td>Common worm infestations e.g. hookworm, roundworm, thread worm</td>
<td>Yes</td>
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</tbody>
</table>

9 **Cardiovascular system**

| Clinical examination of the cardiovascular system | Yes |
| Functional anatomy, physiology and investigations | Yes |
| **Major manifestations of cardiovascular disease** | Yes |
| Chest pain, breathlessness, palpitation, Acute circulatory failure (cardiogenic shock) Presyncope and syncope, Cardiac arrest and sudden cardiac death, Abnormal heart sounds and murmurs. | Yes |
| ECG, x ray chest with reference to common CVS diseases | Yes |
| Acute and chronic congestive cardiac failure | Yes |
| Rheumatic fever and rheumatic heart disease | Yes |
| Valvular heart disease | Yes |
| Infective endocarditis | Yes |
| Coronary artery disease | Yes |
| Common congenital heart disease in the adults: ASD, VSD, PDA, TOF and coarctation of aorta | Yes |
| Cor pulmonale | Yes |
| Hypertension and hypertensive heart disease | Yes |
| Common cardiac arrhythmias | Yes |
| Deep vein thrombosis | Yes |
| Atherosclerosis and peripheral vascular disease | Yes |
| Pericardial disease: pericardial effusion and cardiac tamponade | Yes |
| Aortic aneurysm | Yes |
| Myocarditis and cardiomyopathy | Yes |

10 **Respiratory system**

| Clinical examination of the respiratory system | Yes |
| Respiratory physiology and diagnostic investigations – x ray chest, sputum examination, pulmonary function tests | Yes |
| Bronchoscopy | Yes |
| **Major manifestations of lung disease** | Yes |
| Cough, dyspnoea, chest pain, haemoptysis, the solitary radiographic pulmonary lesion, Acute and chronic respiratory failure | Yes |
| Upper respiratory infections | Yes |
| Pneumonias | Yes |
| Bronchial asthma | Yes |
| Chronic obstructive pulmonary disease | Yes |
| Pulmonary tuberculosis: different presentations | Yes |
| Suppurative lung diseases: bronchiectasis, lung abscess | Yes |
| Pleural diseases – effusion, empyema, pneumothorax | Yes |
| Interstitial and infiltrative lung diseases | Yes |
| Common occupational lung diseases | Yes |
| Tumors of the bronchus and lung | Yes |
| Pulmonary vascular diseases  
  - Pulmonary hypertension  
  - Pulmonary thromboembolism | Yes |
| Acute respiratory distress syndrome | Yes |
| Obstructive sleep apnoea | Yes |
| Diseases of the nasopharynx, larynx and trachea | Yes |
| Diseases of the mediastinum, diaphragm and chest wall | Yes |

### Renal and genito-urinary system

| Renal physiology and common renal function tests: urine examination, renal function tests, common imaging methods | Yes |
| Major manifestations of renal and urinary tract disease: Dysuria, pyuria, urethral symptoms, disorders of urine volume, hematuria, proteinuria, oedema, incontinence, obstruction of the urinary tract. | Yes |
| Acute renal failure | Yes |
| Chronic renal failure | Yes |
| Urinary tract infections and pyelonephritis | Yes |
| Congenital abnormalities of the kidneys and urinary system | Yes |
| Glomerulonephritides and nephrotic syndrome | Yes |
| Tubulo-interstitial diseases | Yes |
| Renal involvement in systemic disorders | Yes |
| Drugs and the kidney | Yes |
| Renal vascular diseases | Yes |
| Urinary tract calculi and nephrocalcinosis | Yes |
| Tumors of the kidney and genitourinary tract | Yes |
| **Renal replacement therapy:** basics | Yes |

### Gastrointestinal tract

| Clinical examination of the abdomen | Yes |
| Basic investigations: stool examination, role of imaging, endoscopy and tests of functions. | Yes |
| **Major manifestations of gastrointestinal disease**  
  Abdominal pain (acute and chronic), dysphagia, dyspepsia, vomiting, constipation, diarrhea, abdominal lump, weight loss, gastrointestinal bleeding-upper and lower, approach to the patient with gastrointestinal disease | Yes |
| Diseases of the mouth and salivary glands – oral ulcers, candidiasis, Parotitis. | Yes |
| Diseases of the oesophagus – GERD, other motility disorders, oesophagitis, carcinoma oesophagus. | Yes |
| Diseases of the stomach and duodenum-gastritis, peptic ulcer disease, tumors of stomach. | Yes |
| **Disease of the small intestine**  
  Acute gastroenteritis & food poisoning , acute, sub-acute and chronic intestinal obstruction, intestinal tuberculosis | Yes |
| Inflammatory bowel disease  
  Malabsorption syndrome  
  Tumors of small intestine | Yes |
| **Disorders of the colon and rectum**  
  Bacillary dysentery, amoebic colitis ,ulcerative colitis  
  Tumors of the colon & rectum & Irritable bowel disease | Yes |
<p>| Abdominal tuberculosis :peritoneal, nodal, gastrointestinal | Yes |
| Ischaemic gut injury | Yes |
| Anorectal disorders | Yes |
| Diseases of the peritoneal cavity :acute and chronic peritonitis, | Yes |</p>
<table>
<thead>
<tr>
<th>13</th>
<th><strong>Disease of pancreas</strong></th>
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<tbody>
<tr>
<td></td>
<td>Acute and chronic pancreatitis</td>
<td>Yes</td>
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<td></td>
<td>Tumors of pancreas</td>
<td>Yes</td>
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<td>14</td>
<td><strong>Hepatobiliary tract disease</strong></td>
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<td></td>
<td>Clinical examination of the abdomen for liver and biliary disease</td>
<td>Yes</td>
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<td></td>
<td>Functional anatomy, physiology, liver function tests, basics of role of imaging of the hepatobiliary disease</td>
<td>Yes</td>
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<td></td>
<td><strong>Major manifestations of liver disease</strong></td>
<td>Yes</td>
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<td></td>
<td>‘Asymptomatic’ abnormal liver function tests</td>
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<td></td>
<td>Jaundice</td>
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<td>Acute (fulminant) hepatic failure</td>
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<td></td>
<td>Portal hypertension and ascites</td>
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<td></td>
<td>Hepatic (porto-systemic encephalopathy)</td>
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<td></td>
<td><strong>Hepatorenal failure</strong></td>
<td>Yes</td>
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<td></td>
<td>Liver abscess- amoebic &amp; pyogenic</td>
<td>Yes</td>
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<td></td>
<td>Acute and chronic hepatitis – viral and toxic</td>
<td>Yes</td>
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<td></td>
<td>Alcoholic liver disease</td>
<td>Yes</td>
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<td>Cirrhosis of liver and chronic liver disease</td>
<td>Yes</td>
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<td>Fatty liver and non alcoholic steatohepatitis</td>
<td>Yes</td>
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<td>Infiltrative diseases of liver</td>
<td>Yes</td>
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<td></td>
<td>Acute and chronic ‘cholecystitis’, choledolithiasis</td>
<td>Yes</td>
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<td>Tumors of gall bladder and bile ducts</td>
<td>Yes</td>
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<td>15</td>
<td><strong>Endocrine and Metabolic disorders</strong></td>
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<tr>
<td></td>
<td>Diabetes mellitus: aetiopathogenesis, diagnosis, management, recognition of acute and chronic complications, and immediate management of acute complications, special problems in management.</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hypo and hyperthyroidism – major manifestations, recognition, interpretation of thyroid function tests</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Iodine deficiency disorders</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cushing’s syndrome and Addison’s disease - recognition</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pituitary disorders: Acromegaly and Sheehan’s syndromes</td>
<td>Yes</td>
<td></td>
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<tr>
<td></td>
<td>Calcium and phosphorus metabolism: parathyroid and metabolic bone Disease.</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hypogonadism</td>
<td>Yes</td>
<td></td>
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<tr>
<td></td>
<td>Hypopituitarism and hyperpituitarism</td>
<td>Yes</td>
<td></td>
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<tr>
<td></td>
<td>Hypothalamic disorders</td>
<td>Yes</td>
<td></td>
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<tr>
<td></td>
<td>Hypoparathyroidism and hyperparathyroidism</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td><strong>Hematological disorders</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Definition, prevalence, etiological factor, pathophysiology, pathology, recognition, investigations and principles of treatment of:</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Anemias: iron deficiency, megaloblastic and common haemolytic anemias (thalassemia, sickle cell and acquired hemolytic)</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Common bleeding disorders (thrombocytopenia and hemophilia)</td>
<td></td>
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<tr>
<td></td>
<td>Agranulocytosis and aplastic anemia</td>
<td></td>
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<tr>
<td></td>
<td><strong>Leukemias</strong>: Recognition, diagnosis, differential diagnosis and broad principles of management</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Lymphomas</strong>: Recognition, diagnosis, differential diagnosis and broad principles of management</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Blood group and transfusion</strong>: Major blood group systems and histo compatibility complex, concepts of transfusion and component therapy; indications for transfusion therapy, precautions to be taken during blood transfusion, hazards of</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>
transfusion and safe handling of blood and blood products.

Disorders of coagulation and venous thrombosis | Yes
Bone marrow transplantation | Yes

17 Disorders of the Immune System, Connective Tissue and Joints

<table>
<thead>
<tr>
<th>Topic</th>
<th>Yes/No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction to the immune system and autoimmunity</td>
<td>Yes</td>
</tr>
<tr>
<td>Primary immune deficiency diseases</td>
<td>Yes</td>
</tr>
<tr>
<td>HIV, AIDS and related disorders</td>
<td>Yes</td>
</tr>
<tr>
<td>Recognition of major manifestations of musculoskeletal disease: Joint pain, bone pain, muscle pain and weakness, regional periarticular pain, back and neck pain.</td>
<td>Yes</td>
</tr>
<tr>
<td>Approach to articular and musculoskeletal disorders</td>
<td>Yes</td>
</tr>
<tr>
<td>Inflammatory joint disease</td>
<td>Yes</td>
</tr>
<tr>
<td>Infectious arthritis</td>
<td>Yes</td>
</tr>
<tr>
<td>Inflammatory muscle disease</td>
<td>Yes</td>
</tr>
<tr>
<td>Osteoarthritis</td>
<td>Yes</td>
</tr>
<tr>
<td>Systemic connective tissue diseases – systemic lupus erythematosus, rheumatoid arthritis, progressive systemic sclerosis</td>
<td>Yes</td>
</tr>
<tr>
<td>Vasculitides</td>
<td>Yes</td>
</tr>
<tr>
<td>Ankylosing spondylitis, reactive arthritis and undifferentiated spondyloarthritis</td>
<td>Yes</td>
</tr>
<tr>
<td>Sarcoidosis</td>
<td>Yes</td>
</tr>
<tr>
<td>Amyloidosis</td>
<td>Yes</td>
</tr>
<tr>
<td>Musculoskeletal manifestations of disease in other systems</td>
<td>Yes</td>
</tr>
<tr>
<td>Diseases of bone</td>
<td>Yes</td>
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</tbody>
</table>

18 Neurological Diseases

<table>
<thead>
<tr>
<th>Topic</th>
<th>Yes/No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical examination of nervous system</td>
<td>Yes</td>
</tr>
<tr>
<td>Functional anatomy, physiology and investigations : EEG, basics of brain and spinal cord imaging</td>
<td>Yes</td>
</tr>
<tr>
<td>Major manifestations of nervous system disease: Headache and facial pain, raised intracranial tension, faintness, dizziness, syncope &amp; vertigo, sleep disorders, disorders of movement, ataxia, sensory disturbances(numbness, tingling and sensory loss), acute confusional states coma and brain death, aphasias and other focal cerebral disorders, speech, swallowing and brain-stem disturbance, visual disturbances, sphincter disturbances.</td>
<td>Yes</td>
</tr>
<tr>
<td>Migraine and cluster headaches</td>
<td>Yes</td>
</tr>
<tr>
<td>Seizures and epilepsy</td>
<td>Yes</td>
</tr>
<tr>
<td>Cerebrovascular disease</td>
<td>Yes</td>
</tr>
<tr>
<td>Dementias including Alzheimer’s disease</td>
<td>Yes</td>
</tr>
<tr>
<td>Acute and chronic meningitis</td>
<td>Yes</td>
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<tr>
<td>Viral encephalitis</td>
<td>Yes</td>
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<tr>
<td>Diseases of cranial nerves</td>
<td>Yes</td>
</tr>
<tr>
<td>Intracranial tumours</td>
<td>Yes</td>
</tr>
<tr>
<td>Diseases of spinal cord – transverse myelitis and cord compression</td>
<td>Yes</td>
</tr>
<tr>
<td>Multiple sclerosis and other demyelinating diseases</td>
<td>Yes</td>
</tr>
<tr>
<td>Parkinson’s disease and other extrapyramidal disorders</td>
<td>Yes</td>
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<tr>
<td>Cerebellar disorders</td>
<td>Yes</td>
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<tr>
<td>Motor neuron disease</td>
<td>Yes</td>
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<tr>
<td>Peripheral neuropathy</td>
<td>Yes</td>
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<tr>
<td>Neurological manifestations of system diseases</td>
<td>Yes</td>
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<tr>
<td>Nutritional and metabolic diseases of the nervous system</td>
<td>Yes</td>
</tr>
<tr>
<td>Myasthenia gravis and other diseases of neuromuscular junction</td>
<td>Yes</td>
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<tr>
<td>Diseases of muscle</td>
<td>Yes</td>
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<tr>
<td>Recognition of brain death</td>
<td>Yes</td>
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</table>

19 Clinical Pharmacology and Therapeutics
<p>| | |</p>
<table>
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<tr>
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<tbody>
<tr>
<td>Principles of drug therapy</td>
<td>Yes</td>
</tr>
<tr>
<td>Adverse drug reactions</td>
<td>Yes</td>
</tr>
<tr>
<td>Drug interactions</td>
<td>Yes</td>
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<tr>
<td>Monitoring drug therapy</td>
<td>Yes</td>
</tr>
<tr>
<td>Rational prescription writing</td>
<td>Yes</td>
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<tr>
<td>Concept of essential drugs</td>
<td>Yes</td>
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<tr>
<td><strong>20 Critical Care Medicine</strong></td>
<td></td>
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<tr>
<td>Physiology of the critically ill patient</td>
<td>Yes</td>
</tr>
<tr>
<td>Recognition of major manifestations of critical illness: circulatory failure: shock, respiratory failure, renal failure, comasepsis, disseminated intravascular coagulation.</td>
<td>Yes</td>
</tr>
<tr>
<td>General principles of critical care management</td>
<td>Yes</td>
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<tr>
<td>Scoring systems of critical care</td>
<td>Yes</td>
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<tr>
<td>Outcome and costs of intensive care</td>
<td>Yes</td>
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<tr>
<td>Ethical issues related to critical care</td>
<td>Yes</td>
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<tr>
<td><strong>21 Pain Management and Palliative Care</strong></td>
<td></td>
</tr>
<tr>
<td>General principles of pain</td>
<td>Yes</td>
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<tr>
<td>Assessment and treatment of pain</td>
<td>Yes</td>
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<tr>
<td>Palliative care</td>
<td>Yes</td>
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<tr>
<td><strong>22 Geriatrics</strong></td>
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<tr>
<td>Principles of Geriatric Medicine</td>
<td>Yes</td>
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<tr>
<td>Normal ageing</td>
<td>Yes</td>
</tr>
<tr>
<td>Clinical assessment of frail elderly</td>
<td>Yes</td>
</tr>
<tr>
<td>Decisions about investigations and rehabilitation</td>
<td>Yes</td>
</tr>
<tr>
<td>Major manifestations of diseases in elderly</td>
<td>Yes</td>
</tr>
<tr>
<td>Special issues for care of elderly</td>
<td>Yes</td>
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<tr>
<td><strong>23 Medical Ethics</strong></td>
<td></td>
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<tr>
<td>Principles of medical ethics: Beneficence, non–maleficence, patient autonomy, equity Different concepts- health ethics, bioethics, public health ethics</td>
<td>Yes</td>
</tr>
<tr>
<td>Ethics of the individual: Confidentiality, physician patient relationship, Patient autonomy, organ donation</td>
<td>Yes</td>
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<tr>
<td>Death and dying, and Euthanasia</td>
<td>Yes</td>
</tr>
<tr>
<td>Ethics of human life: In vitro fertilization, prenatal sex-determination, surrogate motherhood, genetic engineering</td>
<td>Yes</td>
</tr>
<tr>
<td>Professional ethics: Code of conduct, fee charging and splitting, allocation of resources in health care</td>
<td>Yes</td>
</tr>
<tr>
<td>Family and society in medical ethics: Family planning, Care of terminally ill/dying patient</td>
<td>Yes</td>
</tr>
<tr>
<td>Ethical work up of cases: Gathering information, gain confidentiality, shared decision making, informed consent</td>
<td>Yes</td>
</tr>
<tr>
<td>Research ethics: animal and experimental research, human experimentation, informed consent, drug trials</td>
<td>Yes</td>
</tr>
<tr>
<td>Practice of universal precautions</td>
<td>Yes</td>
</tr>
<tr>
<td>Biomedical waste: types, potential risks and their safe management.</td>
<td>Yes</td>
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<tr>
<td>PEP Prophylaxis</td>
<td>Yes</td>
</tr>
<tr>
<td>Hand washing</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>23 Medical Psychiatry</strong></td>
<td></td>
</tr>
<tr>
<td>Classification of psychiatric disorders</td>
<td>Yes</td>
</tr>
<tr>
<td>Aetiological factors in psychiatric disorders</td>
<td>Yes</td>
</tr>
<tr>
<td>The clinical interview and mental state examination</td>
<td>Yes</td>
</tr>
<tr>
<td>Major manifestations of psychiatric illness</td>
<td>Yes</td>
</tr>
<tr>
<td>- Disturbed and aggressive behavior</td>
<td>Yes</td>
</tr>
</tbody>
</table>
### Clinical Syndromes
- Delusional and hallucinations: Yes
- Depressive Symptoms: Yes
- Anxiety symptoms: Yes
- Deliberate self-harm and suicidal ideation: Yes
- Alcohol misuse and withdrawal: Yes
- Misuse of drugs other than alcohol: Yes
- Medically unexplained physically symptoms and functional somatic syndromes: Yes
- Psychiatric and psychological aspects of chronic and progressive disease: Yes

### Treatments used in psychiatry
- Psychological treatments: Yes
- Physical treatments: Yes

### Neurotic, stress-related and somatoform disorders
- Anxiety: Yes
- Obsessive compulsive disorders: Yes
- Dissociative disorders: Yes

### Sleep disorders
- Yes

### Legal aspects of psychiatry
- Yes

### Teaching and Learning methods
Lectures, Small group discussions, Seminars, Algorithms, Problem Based Learning, Videography, Integrated teachings and e-modules.

### Skills
Skill labs, Role play, Problem based - paper and real cases, Integrated teaching and Field visits.

**FUNDAMENTALS OF INTERNAL MEDICINE (CARDINAL SYMPTOMS)**

### Lectures
1. Introduction to the practice of Medicine (Art of medicine, Doctor-Patient relationship, Responsibilities of a doctor and Evidence Based Medicine)
3. Alterations in temperature
4. Pain – Pathophysiology, clinical types, assessment and management
5. Chest pain, dyspnea and palpitations
6. Alterations in pulse and blood pressure
7. Cough, hemoptysis and cyanosis
8. Anorexia, nausea, vomiting, abdominal pain and dysphagia
9. Diarrhoea, constipation and GI bleeding
10. Jaundice and hepatomegaly
11. Ascites, edema and anasarca
12. Pallor, clubbing and bleeding
13. Splenomegaly and lymphadenopathy
14. Urinary tract symptoms (Oliguria, anuria, dysuria, pyuria, hematuria, polyuria, nocturia, chyluria and eneuresis)
15. Weight loss and weight gain
16. Headache, vertigo and dizziness
17. Seizures, syncope and involuntary movements
18. Motor (including gait) disorders and sensory disturbances, speech disorders.
19. Disturbances of consciousness, brain death and organ donation
20. Arthralgias, arthritis and myalgias
21. Genetics – Basic (modes of inheritance, pedigree, clinical application and counselling)
22. Nutritional assessment and needs
23. Physiology of the critically ill patient and general principles of critical care management.
24. CPR, Sudden Cardiac Death
25. Test

Symposia / Modules
1. Communication skills
2. Ethics

INFECTION DISEASES AND ENVIRONMENTAL MEDICINE

Lectures
1. Approach to infectious disease – diagnostic and therapeutic principles; Immune defence mechanisms.
2. Enteric fever and Salmonella infections.
4. Cholera, Shigella and other bacterial diarrhoeas (Traveller's diarrhoea), Food poisoning
5. Brucellosis, plague and Anthrax.
6. Malaria
7. Filariasis and Leishmaniasis
8. Amoebiasis and Giardiasis
9. Hydatid disease and Toxoplasmosis
10. Worm infestations (Hookworm, roundworm, tapeworm, pinworm, Strongyloidiasis)
11. Hemorrhagic fevers (Dengue, leptospirosis and rickettsial)
12. Chikungunya, Avian influenza and SARS
13. Rabies and other encephalitides (JE, HSV)
14. Exanthematous fevers (Measles, mumps, rubella, varicella and Herpes simplex)
15. Bacteremia, sepsis, SIRS, septic shock.
16. Common fungal infections (Candida, Aspergillus, Mucor and Cryptococcus)
17. HIV – Definitions, Transmission, Epidemiology, Clinical Manifestations, Diagnosis, Management
18. HIV and Opportunistic infections
19. Nosocomial infections
20. Stings and bites (Snake bite, scorpion stings and others)
21. Poisoning – General Principles; OP poisoning, carbamate poisoning, Organochlorine poisoning
22. Plant poisons (Yellow oleander, abrus, Cleistanthus collinus and datura)
23. Heat related disorders
24. Drowning and electrical injuries
25. Test

Symposia / Modules
1. Fever with rash
2. FUO
3. Rodenticide, aluminum phosphide, CuSO4, drug overdosage, methyl alcohol and others (2 symposia)
4. Diarrhoea and dysentery
5. HIV infection (Symposium)

DIABETES OF THE GASTROINTESTINAL TRACT AND LIVER DISEASES

Lectures
1. Introduction to basic investigations of the gastrointestinal tract.
2. Diseases of oral cavity and esophagus (GERD, Barrett's esophagus and Achalasia cardia)
3. Acid peptic disease (H. pylori) and non-ulcer dyspepsia
4. Approach to chronic diarrhoea (IBS, IBD and malabsorption)
5. Abdominal tuberculosis - peritoneal, nodal and gastrointestinal
6. Pancreatic function tests, acute and chronic pancreatitis, cystic fibrosis
7. Acute viral hepatitis
8. Chronic hepatitis (viral, autoimmune and granulomatous)
9. Cirrhosis, its complications and treatment
10. Portal hypertension – Causes, classification, complications and management
11. Metabolic liver diseases (Wilson's, hemochromatosis, toxin- and drug-induced)
12. Alcohol related liver disorders and NASH.
13. Parenteral and enteral nutrition, diet therapy.
14. Test

**Symposia / Modules**
1. Ascites
2. Jaundice
3. Chronic diarrhea

**NEPHROLOGY**

**Lectures**
1. Renal physiology and common renal function tests.
3. Glomerular disorders – Overview; Acute nephritis: Etiology, types, pathology, clinical features, diagnosis, treatment and complications.
5. Renal failure – Types, clinical identification, laboratory findings. (Overview)
7. Chronic renal failure (CRF) – Etiopathogenesis, clinical features and complications
9. Test

**Symposia / Modules**
1. Glomerulopathies, tubular disorders.
2. Drugs and the kidney.

**HEMATOLOGY**

**Lectures**
1. Approach to anemia, its classification and investigation.
2. Iron deficiency anemia, sideroblastic anemia and anemia of chronic diseases.
3. Megaloblastic anemia and myelodysplastic syndrome.
4. Aplastic anemia, agranulocytosis and stem cell transplantation.
5. Hemolytic anemia.
6. Acute leukemias.
7. Chronic leukemias.
8. Lymphomas.
9. Multiple myeloma, polycythemia rubra vera and myelofibrosis.
10. Approach to bleeding disorders.
11. Platelet disorders.
12. Clotting factor abnormalities.
13. Disseminated Intravascular Coagulation (DIC), thrombotic disorders and vessel wall abnormalities.
15. Stem cell transplantation.
16. Test.
Symposia
1. Anemia.
2. Bleeding disorders.

ENDOCRINOLOGY

Lectures
1. Introduction to Endocrinology and the HPA axis.
3. Diseases of the pituitary gland – Acromegaly, SIADH, Diabetes insipidus.
4. Thyroid disorders – Thyroid hormone; synthesis, metabolism and action. Hypothyroidism – Causes, clinical features, diagnosis and treatment (including emergencies), Hashimoto’s thyroiditis.
5. Thyroid disorders – Hyperthyroidism – Causes, clinical features, diagnosis and treatment (including emergencies), Simple Goiter, nodular goiter.
6. Disorders of the parathyroid glands (hypo- and hyper-parathyroidism; Ca and PO4 metabolism)
8. Diabetes mellitus - Management
9. Diabetes mellitus – Acute and chronic complications including coma in diabetic patients.
10. Disorders of the adrenal glands – Cushing’s syndrome, Addison’s disease.
11. Disorders of the adrenal glands – Conn’s syndrome, pheochromocytoma.
12. Sexual dysfunction – Hypogonadism (hypogonadotrophic, hypergonadotrophic), impotence.
13. Dyslipidemia
14. Test

Symposia / Modules
1. Interpretation of thyroid and adrenal function tests.
2. Diabetic emergencies / endocrine emergencies.

IMMUNOLOGY, GENETICS AND GERIATRICS

IMMUNOLOGY

Lectures
1. Overview of the immune system; Primary immune deficiency disorders.
2. Major Histocompatibility Complex and disease associations.
3. Hypersensitivity reactions.
4. Classification of autoimmune rheumatological disorders; Rheumatoid arthritis.
5. Systemic autoimmune diseases: Systemic lupus erythematosus, progressive Systemic sclerosis, Sjogren’s syndrome, mixed connective tissue disease and Overlap syndromes.
6. Seronegative spondyloarthritides and crystal arthritides.

GENETICS

Lectures
1. Introduction to genetics: Basics, gene mutations and chromosomal disorders.

GERIATRICS
Lectures
1. Biology of aging, age-related changes and their consequences, principles of Geriatric medicine, clinical assessment of the elderly and the frail elderly.
2. Common geriatric problems – Falls, incontinence, insomnia, depression, constipation, delirium, memory impairment: Special issues in care of the elderly.

NEUROLOGY

Lectures
1. Functional anatomy (anatomy of long tracts and lobar functions), laboratory investigations.
3. Chronic meningitis – overview; TB meningitis, cryptococcal meningitis.
5. Seizure disorders
7. Dementia – overview, Alzheimer's, HIV dementia and alcohol related dementia.
8. Coma – approach, elevated intracranial pressure; hypoxic ischemic encephalopathy, metabolic encephalopathy and Wernicke's encephalopathy.
9. Motor neuron disease and ataxic disorders (Friedrich's and others).
10. Demyelinating disorders – Multiple sclerosis and Acute demyelinating encephalomyelitis (ADEM).
11. Movement disorders, Bell's palsy, Trigeminal neuralgia, other cranial neuropathies.
14. Diseases of the spinal cord – compressive and non-compressive myelopathy, HIV myelopathy, transverse myelitis and subacute combined degeneration (SACD)
15. Muscle disorders – Overview. Myasthenia gravis
17. Test

Symposium
1. COMA
2. Neurological emergencies – (Status epilepticus, others)
3.

CARDIOLOGY

Lectures
2. Valvular diseases of the heart – clinical detection, complications and their Management (MS, MR, AS, AR).
5. Systemic hypertension – Classification; Essential hypertension Clinical presentations, JNC Classification, investigations, complications and treatment.
10. Heart failure – etiopathogenesis, types, clinical features and criteria for diagnosis.
12. Pericardial diseases – Acute pericarditis, constrictive pericarditis, pericardial effusion.
13. Vascular diseases – Aortoarteritis, atherosclerosis, peripheral vascular Disease, Aortic Aneurysm and aortic dissection.
14. Arrhythmias – Atrial fibrillation (AF), Ventricular tachycardia (VT), Ventricular Fibrillation (VF), Supra ventricular tachycardia (SVT) and conduction defects.
15. Primary pulmonary hypertension – etiopathogenesis, clinical features, diagnosis and treatment. Cor pulmonale.
16. Test

Note: Lectures 3; (5 and 6); (10 and 11); and 14 are over a 1.5 hour duration.

Symposia / Modules
1. Heart failure.
2. Hypertension.

RESPIRATORY SYSTEM

Lectures
1. Pneumonia – Typical, atypical, Ventilator Associated and Hospital Aquired.
2. Bronchial asthma and Tropical Pulmonary Eosinophilia
3. Chronic obstructive pulmonary disease (Chronic bronchitis and emphysema)
4. Suppurative lung disease (Bronchiectasis, lung abscess and empyema)
5. Pulmonary tuberculosis – Introduction and epidemiology
6. Pulmonary tuberculosis – Primary and post-primary
7. Pulmonary tuberculosis – Diagnosis and treatment (RNTCP/DOTS) – Lecture 1
8. Pulmonary tuberculosis – Diagnosis and treatment (RNTCP/DOTS) – Lecture 2
9. ExtraPulmonary tuberculosis
10. Interstitial lung disease and Occupational lung diseases (Pneumoconioses)
11. Pleural diseases – Pleural effusion and pneumothorax
12. Lung neoplasms and Sleep Apnea
13. Test

Symposia / Modules
a) Pulmonary Function Tests, sputum examination and chest radiograph interpretation
b) Laboratory investigations in respiratory disease
c) Respiratory emergencies – Acute respiratory failure, chronic respiratory failure, status asthmaticus.
DERMATOLOGY
**DERMATOLOGY**

**Objectives**

At the end of the course, the learners shall be able to:

1. Demonstrate good knowledge of common skin diseases, clinical manifestations, bedside investigations with special emphasis on clinical diagnosis.
2. Demonstrate comprehensive knowledge of various modes of topical therapy.
3. Describe the mode of action of commonly used dermatological drugs, their doses, side effects, toxicity, indications and contraindications and interactions.

**Knowledge**

<table>
<thead>
<tr>
<th>Skin Infections:</th>
<th>Must Know</th>
<th>Desirable to know</th>
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</thead>
<tbody>
<tr>
<td>a) bacterial - including Leprosy and STD</td>
<td>Yes</td>
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<tr>
<td>b) Viral - including Retroviral diseases</td>
<td>Yes</td>
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<tr>
<td>c) Fungal</td>
<td>Yes</td>
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<table>
<thead>
<tr>
<th>Infestations</th>
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<tbody>
<tr>
<td>a) Scabies</td>
<td>Yes</td>
</tr>
<tr>
<td>b) Pediculosis</td>
<td>Yes</td>
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<table>
<thead>
<tr>
<th>Nutritional Disorders</th>
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<tbody>
<tr>
<td>a) Pellagra</td>
<td>Yes</td>
</tr>
<tr>
<td>b) Riboflavin deficiency</td>
<td>Yes</td>
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<tr>
<td>c) Vitamin A deficiency</td>
<td>Yes</td>
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<th>Allergies:</th>
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<tbody>
<tr>
<td>a) Drug induced – such as acute urticaria, angioedema, drug rash. FDE, Erythema Multiforme, Maculopapular rash, SJ Syndrome</td>
<td>Yes</td>
</tr>
<tr>
<td>b) Environmental – contact dermatitis</td>
<td>Yes</td>
</tr>
<tr>
<td>c) Constitutional – atopic dermatitis, eczema and seborrhoeic dermatitis</td>
<td>Yes</td>
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<thead>
<tr>
<th>Dermatological Emergencies: (Diagnosis and Referrals)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>- Toxic Epidermal Necrolysis</td>
<td>Yes</td>
</tr>
<tr>
<td>- Pemphigus vulgaris and its variants</td>
<td>Yes</td>
</tr>
<tr>
<td>- Erythroderma</td>
<td>Yes</td>
</tr>
<tr>
<td>- Staphylococcal Scalded Skin Syndrome</td>
<td>Yes</td>
</tr>
</tbody>
</table>

| Other common skin diseases – Acne Vulgaris, Lichen Planus, psoriasis, Vitiligo, Melasma, Herpes Zoster. | Yes |

**Examination Skills**

<table>
<thead>
<tr>
<th>Skills</th>
<th>Perform independently</th>
<th>Perform under Supervision</th>
<th>Assist the expert</th>
<th>Observe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good and complete skin examination including hairs and nails</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good and complete examination of the genitalia, and oral mucosa</td>
<td>Yes</td>
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</tr>
</tbody>
</table>

**Leprosy**

<p>| | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>1) Must be able to demonstrate anaesthesia in patches and extremities</td>
<td>Yes</td>
</tr>
<tr>
<td>2) Demonstration thickened nerves</td>
<td>Yes</td>
</tr>
<tr>
<td>3) Classify and manage Hansen’s disease and differentially diagnose a hypopigmented patch.</td>
<td>Yes</td>
</tr>
<tr>
<td>4) Clinically identify Type I and Type II Reactions in Leprosy and manage acute reactions</td>
<td>Yes</td>
</tr>
<tr>
<td>5) Prevent deformities in Leprosy, through</td>
<td>Yes</td>
</tr>
</tbody>
</table>
counseling etc
6) Care of deformities in limbs and ulcer care  Yes

**STD syndromes**
1) Syndromic management  Yes
2) HIV counseling  Yes
3) Contact tracing  Yes
4) Treatment of contacts  Yes
Skills for various compresses.  Yes

Incision and drainage.  Yes
Molluscum contagious and Warts removal techniques  Yes

Management of allergies  Yes
Management of Dermatological Emergencies.  Yes

Perform Bedside diagnostic tests: Tzanck smear Tissue Smear Gram staining  Yes

Slit smear for AFB  Yes
Dark Ground Microscopy  Yes
Skin Biopsies  Yes

**LASERs Handling**
PUVA Therapy including Narrow Band UVB therapy  Yes

Chemical peels  Yes
Patch Testing  Yes

Minor Dermatological surgical procedures  Yes

**Assessment**
Formative at the end of capsule course and clinical postings
Summative at the end of the Course

**Tools:**

**Theory**
Problem solving MCQs,
Structured Long questions
Problem solving long questions
Short answer questions
Practical
Short cases
OSCE

**Summative examination to be included along with Medicine**

**Teaching learning methods:**
Structured interactive sessions
Small group discussions
Self-learning tools like

1. Assignments
2. Problem based learning
3. Written case scenarios
4. Simulated patient management problems
5. Tutorials, workshops
6. One to one teaching in ward

**Learning resource materials**
Textbooks, Internet, CDs, Videos, Skill laboratories etc.

**Recommended Text Books**
Review of Dermatology by Vijay K Garg, A M Kochhar, K Sardana
Roxburg’s Common Skin Diseases
PSYCHIATRY AND BEHAVIOURAL SCIENCES
BEHAVIOURAL SCIENCES

Learning Objectives

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

1. Understand the nature and development of different aspects of normal human behaviour like learning, memory, motivation, emotion, personality and intelligence.
7. Recognise differences between normal and abnormal behaviour
8. Understand how psychological and social factors influence human behaviour throughout his life cycle, and how they affect his response to health and illness.
9. Conduct psychosocial evaluation of the patient in respect to attributes like socio-economic status; attitude to health and disease and health services.
11. Communicate effectively with patient, his family and community.
12. Possess and utilise the knowledge and skills of behavioural sciences / techniques for adoption of health practices.
13. To sensitise the medical student regarding human behaviour normal and abnormal and have the ability to observe and understand the same, a process which is continuous and life long in his profession.

COURSE CONTENT

<table>
<thead>
<tr>
<th></th>
<th>Topics</th>
<th>Must know</th>
<th>Desirable to know</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction to types of behavioural sciences: sociology, psychology, anthropology relevant to health and disease.</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Family studies: role of family in health and disease</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Illness and health: Mores about health and illness.</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Socio-economic status: Relationship of socio-economic status with health and mental illness.</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Communication skills: interview techniques, methods of communication with patients and their relatives, role of communication in interpersonal relationship.</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Methods of social work: social case work</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Introduction to psychology – Basis of human behaviour, application of psychology to medicine.</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Human development: Infancy to adolescence: Stages of development and individual differences.</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Human development: adulthood to old age – development tasks of adulthood and old age; adjustment problems of old age.</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Personality development: types of personality and pre-morbid personality and its relationship with illness and behaviour</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Death and dying: Reactions of terminally ill patient and family; breaking news of fatal illness / death to the family.</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Learning and conditioning: Nature of learning; performance role of motivation in learning and methods to make learning effective.</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Cognitive process: Sensory process- attention, perception, sensation and thinking; sensory process and psychopathology; problem solving decision making and communication in thinking process; salient features of abnormal thinking.</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Emotion: relationship of emotion to illness.</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Intelligence: Nature of intelligence; role of genetic and environmental</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>

109
<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>Behavioural medicine: behavioural aspects applied to illness</td>
</tr>
<tr>
<td>17</td>
<td>Coping and stress: different stressors and their effects.</td>
</tr>
<tr>
<td>18</td>
<td>Doctor- patient relationship.</td>
</tr>
<tr>
<td>19</td>
<td>Illness behaviour</td>
</tr>
<tr>
<td>20</td>
<td>Psychological methods of treatment: counselling</td>
</tr>
<tr>
<td>21</td>
<td>Attitudes : Nature and development of attitudes</td>
</tr>
<tr>
<td>22</td>
<td>To be aware of the security aspects as per the demands of the situation, region: Security of the person, the citizen; physical trauma; Psychological trauma; &quot;psychological support and first aid- psychological support during disasters.</td>
</tr>
</tbody>
</table>

### BRAIN AND BEHAVIOR

The following items to be covered by the multidisciplinary team in the dept of psychiatry During the first and second terms -

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>23</td>
<td>Introduction to types of behavioural sciences :Aspects of health economics and management sciences</td>
</tr>
<tr>
<td>24</td>
<td>Family studies: Types of families: structure and functioning; social Problems</td>
</tr>
<tr>
<td>25</td>
<td>Illness and health: Beliefs, customs, norms.</td>
</tr>
<tr>
<td>26</td>
<td>Socio-economic status: Measurement of socio-economic status.</td>
</tr>
<tr>
<td>27</td>
<td>Communication skills: Communication medias.</td>
</tr>
<tr>
<td>28</td>
<td>Methods of social work: social group work and community organisation.</td>
</tr>
<tr>
<td>29</td>
<td>Introduction to psychology – Role of nature vs. nurture in shaping Human behaviour</td>
</tr>
<tr>
<td>30</td>
<td>Human development: Infancy to adolescence: Behavioural expectancies and problems</td>
</tr>
<tr>
<td>31</td>
<td>Human development: adulthood to old age – adjustment in old age to old age diseases.</td>
</tr>
<tr>
<td>32</td>
<td>Learning and conditioning: Learning of adaptive and maladaptive behaviours; Various learning methods like association, cognitive, verbal, motor and social.</td>
</tr>
<tr>
<td>33</td>
<td>Cognitive process: Methods of improving memory; forgetting and its determinants; thinking process- concept formation; role of language</td>
</tr>
<tr>
<td>34</td>
<td>Emotion: Development of emotive behaviour and its physiological basis</td>
</tr>
<tr>
<td>35</td>
<td>Intelligence: Assessment of intelligence in clinical setting; growth of intelligence from birth to old age.</td>
</tr>
<tr>
<td>36</td>
<td>Behavioural medicine: Methods of behavioural treatment for psychosomatic diseases.</td>
</tr>
<tr>
<td>37</td>
<td>Coping and stress: Methods of adaptive and maladaptive coping and stress management.</td>
</tr>
<tr>
<td>38</td>
<td>Illness behaviour: Sick role; role of socio- cultural background in illness behaviour.</td>
</tr>
<tr>
<td>39</td>
<td>Attitudes: theories and methods to change attitudes; measurement of attitudes</td>
</tr>
<tr>
<td>40</td>
<td>Optimal Communication with one another in team and with patients and their families, regarding security of the citizen, as per the demands of the region and situation.</td>
</tr>
<tr>
<td>41</td>
<td>Social security: Social assistance and social insurance; social security schemes.</td>
</tr>
<tr>
<td>42</td>
<td>To be aware of the disasters man-made or natural and the preparedness to disaster &amp; management of disasters in team-work paradigm.</td>
</tr>
<tr>
<td>43</td>
<td>Mock-drill participation in disaster, in team work paradigm, behavioural aspects.</td>
</tr>
</tbody>
</table>
BEHAVIOURAL SCIENCES –SKILLS
(To be acquired after integrated teaching in preclinical years-phase I
To be of use to clinical psychiatry during the clinical exposure)

<table>
<thead>
<tr>
<th>Skills</th>
<th>Perform independently</th>
<th>Perform under Supervision</th>
<th>Assist the expert</th>
<th>Observe</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Understanding Normal and abnormal behaviour, recognising abnormal behaviour</td>
<td></td>
<td></td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>2. Unconscious, Subconscious, Conscious mind ; Id, Ego Superego(Psychoanalytic Approaches)</td>
<td></td>
<td></td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>3. Behavioural Analysis</td>
<td></td>
<td></td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>4. Behavioural changes in Anxiety: Normal Anxiety and Generalised Anxiety Disorder</td>
<td></td>
<td></td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>5. Detection of unhappiness, hopelessness, helplessness, worthlessness.</td>
<td></td>
<td></td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>6. Meaning of Bio-psycho-social in Causation and in Interventional Approaches</td>
<td></td>
<td></td>
<td></td>
<td>Yes</td>
</tr>
</tbody>
</table>

PSYCHIATRY
Learning Objectives
Able to student to deliver mental health services at the primary care level:
1. Able to identify signs and symptoms of common psychiatric illnesses
2. Able to identify developmental delays including Cognitive delays
3. Aware of common psychopharmacological interventions in Psychiatry
4. Able to apply basic counselling skills and have comfort with discussing common psychological issues.
5. Able to understand the nature and development of normal human behaviour.
6. Able to appreciate the interplay between Psychological and Physical factors in medical presentations.
7. Aware of statutory and educational provisions with regard to psychiatric illnesses and disability.
8. Able to develop helpful and humane attitude towards psychological, psychiatric and behavioural difficulties.
9. And overall, able to deliver mental health services at the primary care level.

PSYCHIATRY & DRUG /ALCOHOL DE-ADDICTION -

COURSE CONTENT

<table>
<thead>
<tr>
<th>Topics</th>
<th>Must Know</th>
<th>Desirable to know</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Substance Abuse Ask about alcohol use, identify problem drinking, educate and advise, refer appropriately.</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>2. Depression and Anxiety disorders Ask about Depression and Anxiety, Diagnose depression, assess suicide risk, educate and advise, prescribe rationally and discuss referral</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>3. Unexplained Physical complaints Identify Physical symptom without Medical cause, Elicit stress and coping related Information, Educate, Reassure and refer appropriately.</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>4. Cognitive Delays Identify developmental delay, Basic education and advise, Discuss referral</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>5. Sleep Educate regarding Sleep Hygiene, Prescribe rationally, Look for other psychiatric Possibilities</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>6. Mental functions: primary and higher Elicit signs and symptoms of delirium Identify Early Cognitive decline Educate family, Plan</td>
<td>Yes</td>
<td></td>
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</tbody>
</table>
referral.

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<tbody>
<tr>
<td>7.</td>
<td>Agitated/Violent patient Emergency management keeping forensic and transportation needs in mind</td>
</tr>
<tr>
<td>8.</td>
<td>Psychoses - Identify, provide immediate care and refer. Educate regarding Continued care in discussion with the psychiatrist.</td>
</tr>
<tr>
<td>9.</td>
<td>Concept of mental hygiene and Mental Health promotional issues related to Death and Dying Breaking Bad news, Eliciting reactions and support</td>
</tr>
<tr>
<td>10.</td>
<td>Signs and symptoms of Alcoholism, Its Medical and Psychosocial impact, treatments available.</td>
</tr>
<tr>
<td>11.</td>
<td>Signs and symptoms of common mental illnesses- Depression, anxiety, somatoform disorders including conversion disorders and psychoses, dementia. Common antidepressants and tranquilisers.</td>
</tr>
<tr>
<td>12.</td>
<td>Basic Counselling Principles</td>
</tr>
<tr>
<td>13.</td>
<td>Child Development and Common developmental disorders</td>
</tr>
<tr>
<td>14.</td>
<td>Interplay of Psychological and Physical aspects in Medical presentations</td>
</tr>
<tr>
<td>15.</td>
<td>Common causes of delirium, behavioural management and safe sedation methods.</td>
</tr>
<tr>
<td>16.</td>
<td>Forensic aspects of violence, attempted suicide and suicide.</td>
</tr>
<tr>
<td>17.</td>
<td>Prevalent Social and Psychological concepts around death and dying</td>
</tr>
<tr>
<td>18.</td>
<td>WHO Primary care classification of mental disorders</td>
</tr>
<tr>
<td>19.</td>
<td>Psychosocial barriers to Help-Seeking for mental illnesses and disability.</td>
</tr>
<tr>
<td>20.</td>
<td>Educational and Statutory provisions regarding psychiatric illnesses and disability.</td>
</tr>
<tr>
<td>21.</td>
<td>Principles of Psycho-education</td>
</tr>
<tr>
<td>22.</td>
<td>Basic psychotherapeutic skills</td>
</tr>
<tr>
<td>23.</td>
<td>Mass hysteria, PTSD</td>
</tr>
<tr>
<td>24.</td>
<td>Chronic Organic Brain Syndrome(Dementia)</td>
</tr>
<tr>
<td>25.</td>
<td>Issues related to Death and Dying Breaking Bad news, Eliciting reactions and support</td>
</tr>
</tbody>
</table>

**PSYCHIATRY & DRUG / ALCOHOL DE-ADDICTION Skills**

<table>
<thead>
<tr>
<th>Skills</th>
<th>Perform independently</th>
<th>Perform under Supervision</th>
<th>Assist the expert</th>
<th>Observe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychiatric history taking</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mental status examination (primary mental functions)</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mental status examination (higher mental functions)</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diagnosis of common straight forward Psychiatric disorders</td>
<td>Yes</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Dealing with PTSD</td>
<td></td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dealing with Mass Hysteria</td>
<td></td>
<td></td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Mental Hygiene</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sleep Hygiene</td>
<td>Yes</td>
<td></td>
<td></td>
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<tr>
<td>Developmental delay assessment</td>
<td>Yes</td>
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</tbody>
</table>
### Physical Methods of Treatment (E.g. ECT – Electro Convulsive Therapy)

<table>
<thead>
<tr>
<th>Method</th>
<th>Present</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Abreaction</td>
<td>Yes</td>
</tr>
<tr>
<td>Brief Psychotherapy</td>
<td>Yes</td>
</tr>
<tr>
<td>Counselling</td>
<td>Yes</td>
</tr>
<tr>
<td>Suspect clinically and refer to the speciality (Psychiatrist) allied speciality (like, neurologist)</td>
<td>Yes</td>
</tr>
<tr>
<td>Behavioural and psychological analysis of Self Destructive Behaviour</td>
<td>Yes</td>
</tr>
<tr>
<td>Child Psychiatric history taking</td>
<td>Yes</td>
</tr>
<tr>
<td>Child and Adolescent Mental status examination (Primary and higher mental functions)</td>
<td>Yes</td>
</tr>
<tr>
<td>Geriatric History taking</td>
<td>Yes</td>
</tr>
<tr>
<td>Geriatric Mental status examination (Primary and higher mental functions)</td>
<td>Yes</td>
</tr>
<tr>
<td>Initial and primary care for the children and adolescents and then refer to the psychiatrist/child &amp; Adolescent psychiatrist/ Geriatric Psychiatrist</td>
<td>Yes</td>
</tr>
<tr>
<td>Terminal care</td>
<td>Yes</td>
</tr>
<tr>
<td>Exercising empathy, compassion and establishing rapport and maintaining rapport, which is a must for all psychiatric interventions (need not necessarily in a long term psycho-therapeutic contract)</td>
<td>Yes</td>
</tr>
<tr>
<td>Psychotherapeutic and behaviour modification approaches for treating neurotic disorders</td>
<td>Yes</td>
</tr>
</tbody>
</table>

### IMPARTING OF KNOWLEDGE / SKILLS:

#### (BEHAVIOURAL SCIENCES)

- Teaching / learning methods
- Small Group discussions
- Seminars
- Written Case scenario discussions
- Bedside teaching
- Problem based learning
- Community Observations

There will be flexibility with regard to the choice of the method of teaching/learning.

All the above except the following specifically mentioned items will be covered by the multidisciplinary team in the psychiatry dept. in concert with the community medicine, in integrated teaching framework wherever felt necessary.

The items which are community based will be covered by the Community Medicine team in the first and second terms, as part of the foundation course—in the form of integrated lectures.

The items which are clinical based will be included during the clinical psychiatry training.

The training of the following clinical items which are skills based will be done in concert with other clinical departments and community medicine department:
INTEGRATED LEARNING MODULES INVOLVING
PSYCHIATRY AND BEHAVIORAL SCIENCES

Teaching / learning methods
Structured Interactive Sessions (SIS)
Group discussions
Seminars
Case discussions
Bedside teaching
Problem based learning
Community Observations
Didactic Lectures

The following will have to be taught as Integrated modules in association with
the other departments mentioned against each. The first Four are included in
the Major Integrated teaching Module list that was separately circulated. The
rest are to be taken up by the Department of psychiatry as part of its training
between III and VII terms.

Clinical Psychiatry training will need the following -
1. 12 full days of clinical postings
2. 3 half day seminars and One whole day workshop as detailed under integrated
   modules.
3. 1 half day workshop during Paediatric postings.
4. 2 half day workshops during Medical postings
5. 10 hours of lectures which is a significant reduction from the present situation?

ASSESSMENT
Formative assessment after each posting in psychiatry in the form of MCQs and short
answer questions and OSCE for practical evaluation
Summative assessment at the end of ninth semester to be included as part of
General Medicine.

ASSESSMENT TOOLS:
Theory
Structured long question
Short answer questions
Structured MCQs
Practical
OSCEs
Short case
Viva

REFERENCES
1. ESSENTIAL
      Literature Society.
      Medical Publishers.
      Publication.

2. FOR FURTHER READING
M.M.M. Hospital.
TUBERCULOSIS 
AND 
RESPIRATORY 
DISEASES
TUBERCULOSIS AND RESPIRATORY DISEASES

(i) Goal: The aim of teaching the undergraduate student in Tuberculosis and Chest Diseases is to impart such knowledge and skills that may enable him/her to diagnose and manage common ailments affecting the chest with the special emphasis on management and prevention of Tuberculosis and especially National Tuberculosis control programme.

(i) OBJECTIVES:

(a) Knowledge

At the end of the course of Tuberculosis and Chest-diseases, the student shall be able to:

(1) demonstrate sound knowledge of common chest 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 odes 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.

(b) The student shall 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 respiratory 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-ray and respiratory function test;
(4) interpret and manage various blood gases and PH abnormalities in various respiratory diseases.
(5) manage common diseases recognizing need for referral for specialized care, incase of inappropriateness of therapeutic response;
(6) assist in the performance of common procedures, like laryngoscopic examination, pleural aspiration, respiratory physiotherapy, laryngeal intubation and pneumothoracic 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.

TOPICS FOR THEORY PAPER AND ALLOCATION OF MARKS

Paper I - General medicine (systemic medicine)
Cardiology - Cardiology - 9 marks
Neurology – Neurology – 9 marks
Respiratory & TB – Respiratory & TB – 9 marks
Gastroenterology & Liver diseases – 9 marks  
Nephrology & Fluid and electrolyte – 9 marks  
Cardinal symptoms – 9 marks  
Critical care – 6 marks

**Paper – II**  
**General Medicine including Dermatology, Psychiatry and Tropical Medicine**

<table>
<thead>
<tr>
<th>Subject</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tropical and Environmental Medicine</td>
<td>9</td>
</tr>
<tr>
<td>Infectious Diseases</td>
<td>9</td>
</tr>
<tr>
<td>Endocrinology &amp; Diabetes</td>
<td>9</td>
</tr>
<tr>
<td>Hematology</td>
<td>9</td>
</tr>
<tr>
<td>Geriatrics / Genetics</td>
<td>3</td>
</tr>
<tr>
<td>Nutrition</td>
<td>3</td>
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<tr>
<td>Immunology &amp; Musculoskeletal</td>
<td>6</td>
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<tr>
<td>Dermatology, STD leprosy</td>
<td>6</td>
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<tr>
<td>Psychiatry</td>
<td>6</td>
</tr>
</tbody>
</table>
OBJECTIVES

At the end of the course, the learner shall be able to:

1. Diagnose and appropriately treat common pediatric and neonatal illnesses.
2. Describe the common pediatric disorders and emergencies in terms of epidemiology, etiopathogenesis, clinical manifestations, diagnosis, rational therapy and rehabilitation;
3. Identify pediatric and neonatal illnesses and problems that require secondary and tertiary care and refer them appropriately.
4. Advise and interpret relevant investigations.
5. Counsel and guide patient’s parents and relatives regarding the illness, the appropriate care, the possible complications and the prognosis.
6. Provide emergency cardiopulmonary resuscitation to newborns and children.
7. Describe preventive strategies for common infectious disorders, malnutrition, genetic and metabolic disorders, poisonings, accidents and child abuse;
8. Participate in the National Health Programmes effectively.
9. Diagnose and effectively treat acute pediatric and neonatal emergencies.
10. Discharge medico-legal and ethical responsibilities.
11. Perform routine investigative and therapeutic procedures, as applicable to children including neonates.

<table>
<thead>
<tr>
<th>TOPIC</th>
<th>Must know</th>
<th>Desirable to know</th>
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</thead>
<tbody>
<tr>
<td><strong>Vital Statistics</strong></td>
<td></td>
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</tr>
<tr>
<td>2. Maternal, Perinatal, neonatal, infant and preschool mortality rates.</td>
<td>Yes</td>
<td></td>
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<tr>
<td>3. Definition, causes, present status and measures for attainment of goals.</td>
<td>Yes</td>
<td></td>
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<tr>
<td>4. Current National programs such as ICDS, RCH, Vitamin A prophylaxis, IDA, IDD, AFP</td>
<td>Yes</td>
<td></td>
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<tr>
<td>5. UIP, Pulse polio, ARI, Diarrhea Control Program, etc.</td>
<td>Yes</td>
<td></td>
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<tr>
<td>6. Other National programs and Health related Millenium Development Goals</td>
<td>Yes</td>
<td></td>
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<tr>
<td><strong>Growth and Development</strong></td>
<td></td>
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<tr>
<td>7. Normal growth from conception to maturity.</td>
<td>Yes</td>
<td></td>
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<tr>
<td>8. Anthropometry: measurement and interpretation of weight, length/height, head circumference, mid-arm circumference. Use of weighing machines, infantometer</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>9. Interpretation of Growth Charts: Road to Health card and percentile growth curves</td>
<td>Yes</td>
<td></td>
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<tr>
<td>10. Psychological and behavioral problems</td>
<td>Yes</td>
<td></td>
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<tr>
<td>11. Approach to a child with developmental disabilities</td>
<td>Yes</td>
<td></td>
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<tr>
<td>12. Abnormal growth patterns-failure to thrive, short stature</td>
<td>Yes</td>
<td></td>
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<tr>
<td>13. Growth patterns of different organ systems such as lymphoid, brain and sex organs</td>
<td>Yes</td>
<td></td>
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<tr>
<td>14. Normal pattern of teeth eruption.</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>15. Principles of normal development</td>
<td>Yes</td>
<td></td>
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<tr>
<td>16. Important milestones in infancy and early childhood in the areas of gross motor, fine motor, language and personal-social development. 3-4 milestones in each of the developmental fields, age of normal appearance and the</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>
### Preventable causes and assessment of developmental retardation

| 17. | Preventable causes and assessment of developmental retardation | Yes |

### Measurement and interpretation of sitting height, US:LS ratio and arm span.

| 18. | Measurement and interpretation of sitting height, US:LS ratio and arm span. | Yes |

### Sexual maturity rating

| 19. | Sexual maturity rating | Yes |

### Age-independent anthropometric measurement-principles and application.

| 20. | Age-independent anthropometric measurement-principles and application. | Yes |

#### Nutrition


| 24. | Assessment of nutritional status of a child based on history and physical examination | Yes |

| 25. | Protein energy malnutrition - Definition, classification according to IAP/ Wellcome Trust/WHO, acute versus chronic malnutrition. Clinical features of marasmus and kwashiorkar. Causes and management of PEM including that of complications. Planning a diet for PEM. | Yes |


| 28. | Definition, causes and management of obesity | Yes |

#### Immunization

| 29. | National Immunization Programme | Yes |

| 30. | Principles of Immunization. Vaccine preservation and cold-chain | Yes |

| 31. | Types, contents, efficacy storage, dose, site, route, contraindications and adverse reactions of vaccines — BCG, DPT, OPV, Measles, MMR, Hepatitis B and Typhoid: Rationale and methodology of Pulse Polio Immunization | Yes |

| 32. | Investigation and reporting of vaccine preventable diseases. AFP (Acute Flaccid Paralysis) surveillance. | Yes |

| 33. | Special vaccines like H. influenzae b, Pneumococcal, Hepatitis A, Chicken pox, Meningococcal, Rabies | Yes |

#### Infectious Diseases

<p>| 34. | Epidemiology, basic pathology, natural history, symptoms, signs, complications, investigations, differential diagnosis, management and prevention of common bacterial, viral and parasitic infections in the region, with special reference to vaccine-preventable diseases: Tuberculosis, poliomyelitis, diphtheria, whooping cough, tetanus including neonatal tetanus, measles, mumps, rubella, typhoid, viral hepatitis, cholera, chickenpox, giardiasis, amebiasis, intestinal helminthiasis, malaria, dengue fever | Yes |</p>
<table>
<thead>
<tr>
<th>No.</th>
<th>Topic</th>
<th>Page</th>
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<tbody>
<tr>
<td>35</td>
<td>Rational management of fever, PUO</td>
<td>Yes</td>
</tr>
<tr>
<td>36</td>
<td>Kala-azar, leprosy, chlamydia infection</td>
<td>Yes</td>
</tr>
<tr>
<td>37</td>
<td>Hematology: Causes of anemia in childhood. Classification based on etiology and morphology</td>
<td>Yes</td>
</tr>
<tr>
<td>38</td>
<td>Epidemiology, recognition, diagnosis, management and prevention of nutritional anemia-iron deficiency, megaloblastic</td>
<td>Yes</td>
</tr>
<tr>
<td>39</td>
<td>Clinical approach to a child with anemia with/without lymphadenopathy and/or hepato-splenomegaly</td>
<td>Yes</td>
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<tr>
<td>40</td>
<td>Epidemiology, clinical features, investigations and management of thalassemia</td>
<td>Yes</td>
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<tr>
<td>41</td>
<td>Approach to a bleeding child</td>
<td>Yes</td>
</tr>
<tr>
<td>42</td>
<td>Diagnosis of acute lymphoblastic leukemia and principles of treatment</td>
<td>Yes</td>
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<tr>
<td>43</td>
<td>Clinical features and management of hemophilia, ITP, and aplastic anemia</td>
<td>Yes</td>
</tr>
<tr>
<td>44</td>
<td>Diagnosis and principles of management of lymphomas</td>
<td>Yes</td>
</tr>
<tr>
<td>45</td>
<td>Types, clinical features and management of acute hemolytic anemia</td>
<td>Yes</td>
</tr>
<tr>
<td>46</td>
<td>Respiratory system: Clinical approach to a child with cyanosis, respiratory distress, stridor, wheezing. Significance of recession, retraction.</td>
<td>Yes</td>
</tr>
<tr>
<td>47</td>
<td>Etiopathogenesis, clinical features, complications, investigations, differential diagnosis and management of acute upper respiratory infections, pneumonia</td>
<td>Yes</td>
</tr>
<tr>
<td>48</td>
<td>With emphasis on bronchopneumonia, bronchi-litis, bronchitis. Acute and chronic otitis media.</td>
<td>Yes</td>
</tr>
<tr>
<td>49</td>
<td>Etiopathogenesis, clinical features, diagnosis, classification and management of bronchial asthma. Treatment of acute severe asthma.</td>
<td>Yes</td>
</tr>
<tr>
<td>50</td>
<td>Pulmonary tuberculosis- infection versus disease, difference between primary and post-primary tuberculosis. Etiopathogenesis, diagnostic</td>
<td>Yes</td>
</tr>
<tr>
<td>51</td>
<td>Criteria in children versus adults. Diagnostic aids - technique and interpretation of Mantoux test and BCG test. Radiological patterns, chemoprophylaxis and treatment including the DOTS schedule.</td>
<td>Yes</td>
</tr>
<tr>
<td>52</td>
<td>Diagnosis and management of foreign body aspiration.</td>
<td>Yes</td>
</tr>
<tr>
<td>53</td>
<td>Pathogenesis, clinical features and management of pneumothorax, pleural effusion and empyema.</td>
<td>Yes</td>
</tr>
<tr>
<td>54</td>
<td>Multidrug resistant tuberculosis, bronchiectasis, cystic fibrosis.</td>
<td>Yes</td>
</tr>
<tr>
<td>55</td>
<td>Gastrointestinal tract: Clinical approach to a child with jaundice, vomiting, abdominal pain, bleeding, hepatosplenomegaly.</td>
<td>Yes</td>
</tr>
<tr>
<td>56</td>
<td>Acute diarrhea disease - Etiopathogenesis, clinical differentiation of watery and invasive diarrhea, complications of diarrheal illness. Assessment of Dehydration, treatment at home and in hospital. Fluid and electrolyte management. Oral rehydration, composition of ORS.</td>
<td>Yes</td>
</tr>
<tr>
<td>57</td>
<td>Clinical features and management of acute viral hepatitis, causes and diagnosis of chronic liver disease; neonatal cholestasis.</td>
<td>Yes</td>
</tr>
<tr>
<td>58</td>
<td>Features and management of liver failure.</td>
<td>Yes</td>
</tr>
<tr>
<td>59</td>
<td>Common causes of constipation</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Gastroesophageal reflux, GI bleeding, portal hypertension.</td>
<td>Yes</td>
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<tr>
<td>61.</td>
<td>Persistent diarrhea, Reye’s syndrome, Celiac disease, malabsorption syndrome.</td>
<td>Yes</td>
</tr>
<tr>
<td>62.</td>
<td>Drug induced hepatitis.</td>
<td>Yes</td>
</tr>
<tr>
<td>63.</td>
<td>Abdominal tuberculosis, Wilson’s disease</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Central Nervous System</strong></td>
<td></td>
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<tr>
<td>64.</td>
<td>Clinical approach to a child with coma, convulsions, mental retardation</td>
<td>Yes</td>
</tr>
<tr>
<td>65.</td>
<td>Clinical diagnosis, investigations and treatment of acute pyogenic meningitis, encephalitis and tubercular meningitis. Neurocysticercosis</td>
<td>Yes</td>
</tr>
<tr>
<td>66.</td>
<td>Seizure disorders - Causes and types of convulsions at different ages. Diagnosis, categorization and management of epilepsy (broad outline). Febrile convulsions - definition, types, management.</td>
<td>Yes</td>
</tr>
<tr>
<td>67.</td>
<td>Causes, diagnosis and management of cerebral palsy</td>
<td>Yes</td>
</tr>
<tr>
<td>68.</td>
<td>Acute flaccid paralysis - Differentiation between Polio and Gullain-Barre syndrome</td>
<td>Yes</td>
</tr>
<tr>
<td>69.</td>
<td>Microcephaly, hydrocephalus, rheumatic chorea</td>
<td>Yes</td>
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<tr>
<td>70.</td>
<td>Intracranial space occupying lesions, infantile hemiplegia</td>
<td>Yes</td>
</tr>
<tr>
<td>71.</td>
<td>Neuroblastoma</td>
<td>Yes</td>
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<tr>
<td><strong>Cardiovascular system</strong></td>
<td></td>
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<tr>
<td>72.</td>
<td>Clinical features, diagnosis, treatment and prevention of acute rheumatic fever. Common forms of rheumatic heart disease in childhood. Differentiation between rheumatic and rheumatoid arthritis</td>
<td>Yes</td>
</tr>
<tr>
<td>73.</td>
<td>Recognition of congenital acyanotic and cyanotic heart disease. Hemodynamics, clinical features and management of VSD, PDA, ASD and Fallot’s tetralogy</td>
<td>Yes</td>
</tr>
<tr>
<td>74.</td>
<td>Recognition and management of congestive cardiac failure and cyanotic spells in infants and children</td>
<td>Yes</td>
</tr>
<tr>
<td>75.</td>
<td>Diagnosis and management of bacterial endocarditis, pericardial effusion, myocarditis</td>
<td>Yes</td>
</tr>
<tr>
<td>76.</td>
<td>Hypertension in children-recognition, etiology, referral</td>
<td>Yes</td>
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<tr>
<td><strong>Genitourinary system</strong></td>
<td></td>
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<tr>
<td>77.</td>
<td>Approach to a child with proteinuria/hematuria</td>
<td>Yes</td>
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<tr>
<td>78.</td>
<td>Etiopathogenesis, clinical features, diagnosis, complications and management of acute post-streptococcal glomerulonephritis and nephrotic syndrome</td>
<td>Yes</td>
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<tr>
<td>79.</td>
<td>Etiology, clinical features, diagnosis and management of urinary tract infection - related problems</td>
<td>Yes</td>
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<tr>
<td>80.</td>
<td>Etiology, diagnosis and principles of management of acute renal failure</td>
<td>Yes</td>
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<tr>
<td>81.</td>
<td>Hemolytic-uremic syndrome</td>
<td>Yes</td>
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<tr>
<td>82.</td>
<td>Renal and bladder stones</td>
<td></td>
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<tr>
<td>83.</td>
<td>Causes and diagnosis of obstructive uropathy in children</td>
<td>Yes</td>
</tr>
<tr>
<td>84.</td>
<td>Diagnosis and principles of management of chronic renal failure</td>
<td>Yes</td>
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<tr>
<td><strong>Endocrinology</strong></td>
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<tr>
<td>85.</td>
<td>Etiology, clinical features and diagnosis of diabetes and hypothyroidism, and goiter in children</td>
<td>Yes</td>
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<tr>
<td>86.</td>
<td>Delayed and precocious puberty</td>
<td>Yes</td>
</tr>
<tr>
<td>87.</td>
<td>Short stature</td>
<td>Yes</td>
</tr>
<tr>
<td>88.</td>
<td>Ambiguous genitalia</td>
<td>Yes</td>
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<tr>
<td><strong>Neonatology</strong></td>
<td></td>
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<tr>
<td>89.</td>
<td>Definition - live birth, neonatal period, classification according to weight and gestation, mortality rates</td>
<td>Yes</td>
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<tr>
<td>90.</td>
<td>Delivery room management including neonatal resuscitation and temperature control</td>
<td>Yes</td>
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<tr>
<td>No.</td>
<td>Topic</td>
<td>Yes/No</td>
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<tr>
<td>91</td>
<td>Etiology, clinical features, principles of management and prevention of birth asphyxia</td>
<td>Yes</td>
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<tr>
<td>92</td>
<td>Birth injuries - causes and their recognition</td>
<td>Yes</td>
</tr>
<tr>
<td>93</td>
<td>Care of the normal newborn in the first week of life. Normal variations and clinical signs in the neonate</td>
<td>Yes</td>
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<tr>
<td>94</td>
<td>Breastfeeding - physiology and its clinical management</td>
<td>Yes</td>
</tr>
<tr>
<td>95</td>
<td>Identification of congenital anomalies at birth with special reference to anorectal anomalies, tracheo-esophageal fistula, diaphragmatic hernia, neural tube defects</td>
<td>Yes</td>
</tr>
<tr>
<td>96</td>
<td>Neonatal jaundice: causes, diagnosis and principles of management</td>
<td>Yes</td>
</tr>
<tr>
<td>97</td>
<td>Neonatal infection - etiology, diagnosis, principles of management. Superficial infections, sepsis</td>
<td>Yes</td>
</tr>
<tr>
<td>98</td>
<td>Low birth weight babies - causes of prematurity and small-for-date baby, clinical features and differentiation. Principles of feeding and temperature regulation. Problems of low birth weight babies.</td>
<td>Yes</td>
</tr>
<tr>
<td>99</td>
<td>Identification of high risk/sick newborn (i.e., detection of abnormal signs - cyanosis, jaundice, respiratory distress, bleeding, seizures, refusal to feed, abdominal distension, failure to pass meconium and urine)</td>
<td>Yes</td>
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<tr>
<td>100</td>
<td>Transportation of a sick neonate</td>
<td>Yes</td>
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<tr>
<td>101</td>
<td>Recognition and management of specific neonatal problems-hypoglycemia, hypo-calcemia, anemia, seizures, necrotizing enterocolitis, hemorrhage</td>
<td>Yes</td>
</tr>
<tr>
<td>102</td>
<td>Common intra-uterine infections</td>
<td>Yes</td>
</tr>
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<td></td>
<td><strong>Pediatric Emergencies</strong></td>
<td></td>
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<tr>
<td>103</td>
<td>Status epilepticus</td>
<td>Yes</td>
</tr>
<tr>
<td>104</td>
<td>Status asthmaticus / Acute severe asthma</td>
<td>Yes</td>
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<td>105</td>
<td>Shock and anaphylaxis</td>
<td>Yes</td>
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<td>106</td>
<td>Burns</td>
<td>Yes</td>
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<td>107</td>
<td>Hypertensive emergencies</td>
<td>Yes</td>
</tr>
<tr>
<td>108</td>
<td>Gastrointestinal bleeding</td>
<td>Yes</td>
</tr>
<tr>
<td>109</td>
<td>Comatose child</td>
<td>Yes</td>
</tr>
<tr>
<td>110</td>
<td>Congestive cardiac failure</td>
<td>Yes</td>
</tr>
<tr>
<td>111</td>
<td>Common poisonings and snakebite</td>
<td>Yes</td>
</tr>
<tr>
<td>112</td>
<td>Acute renal failure</td>
<td>Yes</td>
</tr>
<tr>
<td>113</td>
<td>Diabetic ketoacidosis</td>
<td>Yes</td>
</tr>
<tr>
<td>114</td>
<td>Pneumothorax</td>
<td>Yes</td>
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<td>115</td>
<td>Acute laryngotracheobronchitis</td>
<td>Yes</td>
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<td></td>
<td><strong>Fluid-Electrolyte</strong></td>
<td></td>
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<tr>
<td>116</td>
<td>Principles of fluid and electrolyte therapy in children</td>
<td>Yes</td>
</tr>
<tr>
<td>117</td>
<td>Pathophysiology of acid-base imbalance and principle of management</td>
<td>Yes</td>
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<tr>
<td></td>
<td><strong>Genetics</strong></td>
<td></td>
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<tr>
<td>118</td>
<td>Principles of inheritance and diagnosis of genetic disorders, Down’s syndrome</td>
<td>Yes</td>
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<td></td>
<td><strong>Behavioral Problems</strong></td>
<td></td>
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<tr>
<td>119</td>
<td>Breath holding spells, nocturnal enuresis, temper tantrums, pica, refusal to feed</td>
<td>Yes</td>
</tr>
<tr>
<td>120</td>
<td>Learning disabilities, Autism</td>
<td>Yes</td>
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<tr>
<td></td>
<td><strong>Pediatric Surgical Problems</strong></td>
<td></td>
</tr>
<tr>
<td>121</td>
<td>Diagnosis and timing of surgery of cleft lip/palate, hypospadias, undescended testis, tracheo-esophageal fistula, hydrocephalus, CTEV, umbilical and inguinal hernia, anorectal malformations, hypertrophic pyloric stenosis</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td><strong>Therapeutics</strong></td>
<td></td>
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<tr>
<td>122</td>
<td>Pediatric doses, drug combinations, drug interactions,</td>
<td>Yes</td>
</tr>
</tbody>
</table>
age specific choice of antibiotics, etc

**Adolescent Medicine**
123. Changes during adolescence, factors affecting adolescent health

**IMNCI**
124. Management of a Young child below 2 months
125. Management of a child between 2 mo-5 yr of age

Other programmes pertaining to maternal and child health

| SKILLS |
|-----------------|-----------------|-----------------|-----------------|
| Skills          | Perform independently | Perform under Supervision | Assist the expert | Observe |
| 1. Prepare ORS  | Yes              |                 |                 |         |
| 2. IMNCI Case Management | Yes           |                 |                 |         |
| 3. Nasogastric tube insertion | Yes       |                 |                 |         |
| 4. Infant young child feeding counseling | Yes |                 |                 |         |
| 5. Anthropometry | Yes             |                 |                 |         |
| 6. Injections (IM, IV, S/C, I/D) | Yes |                 |                 |         |
| 7. Vaccine administration | Yes |                 |                 |         |
| 8. Pleural tap | Yes              |                 |                 |         |
| 9. Ascitic tap | Yes              |                 |                 |         |
| 10. Blood transfusion and monitoring | Yes |                 |                 |         |
| 11. Lumbar puncture | Yes            |                 |                 |         |
| 12. IV cannula insertion and Blood sampling | Yes |                 |                 |         |
| 13. Bone marrow aspiration | Yes            |                 |                 |         |
| 14. Liver biopsy | Yes             |                 |                 |         |
| 15. Kidney biopsy | Yes            |                 |                 |         |
| 16. Peritoneal dialysis | Yes           |                 |                 |         |
| 17. Neonatal resuscitation | Yes |                 |                 |         |
| 18. Intraosseous infusion | Yes |                 |                 |         |
| 19. Exchange transfusion | Yes          |                 |                 |         |

**Teaching and Learning Methods**

Lectures, Small group discussions, Seminars, Tutorials, Quiz, Debates, Algorithms, Problem Based Learning, Videography, Integrated teachings and e-modules. One week modular teaching is recommended for IMNCI.

**Proposed Text Books for Pediatrics**

1. Ghai Textbook of Pediatrics, CBS Publishers
2. Meharban Singh: Clinical Pediatrics
3. Clinical Methods Hutchisons
4. IAP textbook of Pediatrics
5. Suraj Gupte’s Textbook of Pediatrics
6. Meharban Singh Pediatric Emergencies

**Reference text book**

Nelson: Textbook of Pediatrics

**E – MODULES**

The following topics/subjects are available in electronic format and have been specifically prepared for undergraduate students. These can be uploaded on the web to facilitate free access to all students. The details are as follows:
1. Module on teaching of “Infant and young Child feeding (IYCF)”

- Developed by BPNI (Breastfeeding Promotion Network of India) with aid from UNICEF and Experts from Indian Academy of Pediatrics, National Neonatology Forum, Community health, Obstetrics, and Medical Education.
- Available from BPNI, Delhi, India
- Contact person: Professor S. Aneja, Department of Pediatrics, Kalawati Saran Children Hospital and Lady Hardinge Medical College, New Delhi.
- Current status: Ready within a month time.

2. Interactive CD Rom on Breastfeeding

3. Module on teaching of “Prevention and Control of Injuries”

- Developed by WHO, SEARO for teaching undergraduates students of the region with the help of an international core group comprising of experts from the fields of Surgery, Public Health, Medical Education, Legal medicine, Pediatrics, Injury specialists, Trauma Medicine, Psychiatry etc.
- Available from WHO, SEARO, Division of Non-Communicable Diseases, Delhi, India
- Contact person: Professor B. K. Jain, Professor and Head, Department of Surgery, University College of Medical Sciences and GTB Hospital, Delhi 110 095.
- Current status: Ready, Pilot project activated at GTB Hospital, Delhi

4. Module on teaching of “Integrated Management of Neonatal and Childhood Illnesses (IMNCI)”

- Developed by WHO, India with Ministry of Health, Govt. of India for teaching undergraduates students of the country with the help of an international core group comprising of experts from the fields of Public Health, Medical Education, Epidemiologists etc.
- Available from WHO, India. Division of Child Health.
- Contact person: Dr. Harish Kumar, WHO Consultant, IMNCI, Nirman Bhavan, Delhi.
- Current status: Ready, Pilot project completed in 4 medical colleges (Ludhiana, Bangalore, Bhopal, and).

In Addition, the following E-modules are also proposed

- Neonatal resuscitation
- Essential Newborn Care
- Growth and Development
- Childhood disabilities
- Nutritional Disorders
- Bronchial asthma
- Immunization
- Adolescent medicine

Integration

The training in Pediatrics should integrated with other disciplines, including Anatomy, Physiology, Medicine, Surgery, Community Medicine, Obstetrics, and Physical Medicine and Rehabilitation, to 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.
Plan for Theory Internal Assessment:

Total of four \((n)\) Periodic tests to be conducted, and the average of \((n-1)\) tests to be taken as internal assessment (theory)

Total of three \((n)\) Clinical tests to be conducted and the average of \((n-1)\) test marks along with the Records marks to be taken as Internal Assessment Clinical Examination Marks.
GENERAL SURGERY
Objectives

At the end of the course, the learners shall be able to:

1. Diagnose and appropriately manage common surgical ailments in a given situation.
2. Identify situations calling for urgent or early surgical intervention and refer at the optimum time to the appropriate centers.
3. Provide adequate preoperative, post-operative and follow-up care of surgical patients.
4. Counsel and guide patients and relatives regarding need, implications and problems of surgery in the individual patient
5. Provide emergency resuscitative measures in acute surgical situations including trauma. Should be well versed with BLS & ITLS.
6. Organise and conduct relief measures in situations of mass casualties.
7. Effectively participate in the National Health Programmes especially the Family Welfare Programme.
8. Discharge effectively medico-legal and ethical responsibilities

KNOWLEDGE

System Based

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<th>Subject</th>
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Diagnosis and principles of management of urolithiasis

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### Symptoms based
(Preferably learnt during IX semester) Approach to the patient with

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<td>Inguino-scratal swelling</td>
<td>Yes</td>
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<tr>
<td>Scrotal swelling</td>
<td>Yes</td>
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<tr>
<td>Gastric outlet obstruction</td>
<td>Yes</td>
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<tr>
<td>Upper gastrointestinal bleeding</td>
<td>Yes</td>
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<tr>
<td>Lower gastrointestinal bleeding</td>
<td>Yes</td>
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<tr>
<td>Anorectal symptoms</td>
<td>Yes</td>
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<tr>
<td>Acute intestinal obstruction</td>
<td>Yes</td>
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<tr>
<td>Obstructive jaundice</td>
<td>Yes</td>
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<tr>
<td>Acute retention of Urine</td>
<td>Yes</td>
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<tr>
<td>Bladder outlet obstruction</td>
<td>Yes</td>
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<tr>
<td>Haematuria</td>
<td>Yes</td>
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<tr>
<td>Peripheral vascular disease</td>
<td>Yes</td>
<td></td>
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<tr>
<td>Varicose veins</td>
<td>Yes</td>
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<tr>
<td>New born with developmental anomalies</td>
<td>Yes</td>
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</tbody>
</table>
## Skill Based Objectives

<table>
<thead>
<tr>
<th>Skills</th>
<th>Perform independently</th>
<th>Perform under Supervision</th>
<th>Assist the expert</th>
<th>Observe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obtain a proper relevant history, and perform a humane and thorough clinical examination including internal examinations (per-rectal and per vaginal) and examinations of all organs/systems in adults and children</td>
<td>Yes</td>
<td></td>
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<tr>
<td>Arrive at a logical working diagnosis after clinical examination</td>
<td>Yes</td>
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<tr>
<td>Order appropriate investigations keeping in mind their relevance (need based) and cost effectiveness.</td>
<td>Yes</td>
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<tr>
<td>Write a complete case record with all necessary details.</td>
<td>Yes</td>
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<tr>
<td>Write a proper discharge summary with all relevant information</td>
<td>Yes</td>
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<tr>
<td>Obtain informed consent for any examination/procedure</td>
<td>Yes</td>
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<tr>
<td>At the end of the learners should be able to perform:</td>
<td>Yes</td>
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<tr>
<td>Start IV lines and monitor infusions</td>
<td>Yes</td>
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<tr>
<td>Start and monitor blood transfusion</td>
<td>Yes</td>
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<tr>
<td>Venous cut-down</td>
<td>Yes</td>
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<tr>
<td>Manage a C.V.P. line</td>
<td>Yes</td>
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<tr>
<td>Conduct CPR (Cardiopulmonary resuscitation)</td>
<td>Yes</td>
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<td>Basic life support /ITLS</td>
<td>Yes</td>
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<tr>
<td>Endotracheal intubation</td>
<td>Yes</td>
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<tr>
<td>Pass nasogastric tube</td>
<td>Yes</td>
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<tr>
<td>Perform digital rectal examination and proctoscopy</td>
<td>Yes</td>
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<tr>
<td>Urethral catheterisation</td>
<td>Yes</td>
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<tr>
<td>Dressing of the wounds</td>
<td>Yes</td>
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<tr>
<td>Suturing of the simple wounds</td>
<td>Yes</td>
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<tr>
<td>Remove small subcutaneous swellings</td>
<td>Yes</td>
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<tr>
<td>Various types of biopsies</td>
<td>Yes</td>
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<tr>
<td>Relieve pneumothorax</td>
<td>Yes</td>
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<tr>
<td>Infiltration, surface and digital Nerve blocks</td>
<td>Yes</td>
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<tr>
<td>Incise and drain superficial abscesses</td>
<td>Yes</td>
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<tr>
<td>Manage Lacerated wounds</td>
<td>Yes</td>
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<tr>
<td>Control external hemorrhage</td>
<td>Yes</td>
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<tr>
<td>Vasectomy</td>
<td>Yes</td>
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<tr>
<td>Circumcision</td>
<td>Yes</td>
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<tr>
<td>Surgery for hydrocele</td>
<td>Yes</td>
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<tr>
<td>Surgery for hernia</td>
<td>Yes</td>
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<tr>
<td>Injection/banding of piles</td>
<td>Yes</td>
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<tr>
<td>Management of shock</td>
<td>Yes</td>
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<tr>
<td>1. Assessment and management of burns</td>
<td>Yes</td>
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<tr>
<td>All the operations performed by surgeons during surgical posting during general surgical postings</td>
<td>Yes</td>
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</table>

### Skill
Skills to be learnt initially on the models and later on performed under supervision before performing independently, provision of surgical skills laboratories in the Medical Colleges will facilitate this process.

Teaching learning methods:
- Structured interactive sessions
- Small group discussions
- Self learning tools like
  - (a) Assignments
  - (b) Problem based learning
  - (c) Written case scenarios
  - (d) Simulated patient management problems,

in addition to routine classroom and bedside teaching.

Learning resource materials: Text books, Internet, CDs, Videos, Skill laboratories etc.

**Suggested text Books**
- Bailey and love Short practice of Surgery
- A manual of clinical Surgery by S Das
- Hamilton Bailey’s demonstration of clinical signs
- Pye’s Surgical Handicraft

**Suggested topics for e-learning:**

All the topics included in symptom based learning

1. Ulcers in oral cavity
2. Solitary nodule of the thyroid
3. Lymph node in the neck
4. Suspected breast lump
5. Acute abdominal pain
6. Dysphagia
7. Chronic abdominal pain
8. Epigastric mass
9. Right hypochondrium mass
10. Right iliac fossa mass
11. Renal mass
12. Inguino-scrotal swelling
13. Scrotal swelling
14. Gastric outlet obstruction
15. Upper gastrointestinal bleeding
16. Lower gastrointestinal bleeding
17. Anorectal symptoms
18. Acute intestinal obstruction
19. Obstructive jaundice
20. Acute retention of Urine
21. Bladder outlet obstruction
22. Haematuria
23. Peripheral vascular disease
24. Varicose veins
25. New born with developmental anomalies
ORTHOPEDICS
ANAESTHESIOLOGY
RADIODIAGNOSIS
& IMAGING
RADIOThERAPY
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, phalanges 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, radiology and Forensic Medicine be done.

ANAESTHESIOLOGY

The purpose of anesthesia training for medical students is not to make anesthesiologists out of all medical students, but to give students knowledge of basic concepts used in anesthesia and to teach them skills of airway management and vascular access that may be useful to them in other areas of medical practice.

The physician should have a good knowledge of what the anesthetic will do to the patient, even though the physician does not administer it him or herself.

The student, therefore, should observe and study the physiological changes which take place in the anesthetized patient. When these changes are of sufficient magnitude, they become complications or toxic effects. The student should learn what these are, how they are caused, and how they may present and be treated. Emphasis should be laid on good preoperative preparation. Students should learn basic techniques of maintaining a clear airway and giving assisted or artificial ventilation. They should also learn how to position the patient’s head, how to hold the chin and how to insert an airway. Medical students should learn enough about an anesthetic machine.

In addition to these technical accomplishments, the student may have the opportunity to administer either general or spinal anesthesia under the direct and constant supervision of a member of the staff.

OBJECTIVES

Knowledge

The students, at the end of their posting should be able to:
1. Introduce principles of acute medicine as it is practiced in managing the anesthetized patient in the operating room and in managing the patient in the recovery unit.
2. Discuss and demonstrate principles of applied physiology and applied pharmacology. Simulation on Human patient Simulator (HPS) is ideal to teach many aspects of applied physiology and pharmacology.
3. Review principles of and teach skills in resuscitation (cardiopulmonary, cerebral, fluid and others).
4. Teach care of the unconscious patient, including airway and ventilation management.
5. Teach management of blood, fluid, electrolyte balance, and metabolic disturbances in the surgical patient, with specific emphasis on those derangements which are encountered in the anesthetized patient.
6. Review management of acute and chronic pain problems.
7. Introduce concepts of drug interactions, especially as they apply to patients receiving anesthesia.
8. Demonstrate the evaluation of patients relative to surgical and anesthetic risk. Teach appropriate preoperative preparation of patients subjected to surgery and anesthesia.
9. Introduce the various techniques of anesthesiology.
10. Pharmacology of muscle relaxant, application and monitoring
11. Pharmacology: Basic / Applied of local anaesthetics: Various types of blocks advantages / Problems with each. Descriptive for same main blocks. Local infiltration, Brachial Plexus, Caudal etc.

Skills

Maintenance of Clear airway
Bag Mask Ventilation
Starting A Venous Access
CPR — Basic and advanced
Giving a simple infiltration block, Some nerve block
Performing A lumbar puncture

Teaching Learning Methodology

Teaching and learning in anesthesiology should be guided through a series of posting in which the emphasis is laid on practical hands—on experience.

Human patient simulator (HPS) be purchased for better skill development and to reduce the danger to the patients during the learning curve of student. To allow repeat practice according to ability of the student to reach the level of competence needed.

Posting Schedule

Two Weeks in 7th semester
To achieve the objectives The students will be posted to

Preanesthetic Clinic: 1
1. Preoperative evaluation & optimization.
2. Operating theatre: Anaesthetic Machine /monitoring, Anaesthetic Techniques

Emergency On Call
The Intern will be posted to same areas as above and will be asked to follow a case from preoperative preparation to full recovery to get an idea of comprehensive Care.

TEXT BOOK RECOMMENDED


Reference Books

2. Principles and Practice of Anaesthesiology Edited David E. Longnecker Published by Mosby St. Louis.

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.

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.
OBSTETRICS AND GYNAECOLOGY
OBSTETRICS AND GYNAECOLOGY

Departmental Objectives:

At the end of training in Obstetrics and Gynaecology, the student will be able to:

1. Appreciate the socio-cultural, economic and demographic factors that influence the practice of Obstetrics & Gynaecology.
2. Appreciate the principles of reproductive anatomy and physiology.
3. Understand the preconceptual, antenatal, intranatal and postnatal factors that affect the mother and foetus.
4. Recognise the changes and adaptation that occur in the mother during pregnancy, labour and puerperium.
5. Impart antenatal care, detect deviations from normal pregnancy and refer risk cases appropriately.
6. Know the management of normal labour, be aware of the factors that deviate labour from its normal course and refer such cases appropriately.
7. Institute primary treatment in Obstetric and Gynaecological emergencies.
8. Resuscitate and take adequate care of the newborn.
9. Assist couples with infertility and those requiring contraception.
10. Know the normal menstrual cycle, aetiopathology and management of menstrual abnormalities.
11. Know about the benign and malignant tumours of the genital tract and appreciate the need for screening and prevention.
12. Recognise the importance of infections and other diseases of the genital tract.
13. Know about the displacements of genital tract and injuries.
14. Understand the implications of medico-legal and ethical issues concerning the speciality.
15. Acquire communication, decision making and managerial skills.
16. Acquire skills to perform – Obstetrical & Gynaecological examinations and certain minor investigations and therapeutic operative procedures.

COURSE CONTENT

OBSTETRICS:

1. Anatomy of female reproductive tract
   Must know:
   Anatomy of internal and external reproductive organs including their relationship to other pelvic organs.
   Applied anatomy as related to Obstetrics and Gynaecology.
2. Physiology of conception:
   Must know:
   Gametogenesis, Ovulation, menstruation, fertilisation and implantation
   Spermatogenesis. Normal semen parameters
3. Development of fetus and Placenta
   Must know:
   Basic embryology. Development and structure and functions of placenta.
   Fetal development and growth at various gestational ages.
   Teratogenic agents and drugs to be avoided / contraindicated in early pregnancy
4. Diagnosis of Pregnancy
   Must know:
   Clinical symptoms and signs of early pregnancy
   Dating in early pregnancy including USG dating
   Various tests to diagnose pregnancy
   Desirable to know:
   Congenital anomalies that can be diagnosed in early pregnancy
5. Maternal Changes during Pregnancy
   Must know:
The physiological changes in Blood, Cardiovascular, Respiratory, urinary tract and gastrointestinal tract

6. Antenatal care
Must Know:
Desirable to know:
Diagnosis and management of fetal congenital anomalies
PNDT Act.

7. Complications of Early pregnancy
Must know:
Various types of abortions, definitions, causes, investigations and their management.
Diagnosis of Ectopic pregnancy and management
Desirable to know:
Modern management of ectopic pregnancy

8. Hyperemesis Gravidarum
Must know:
Aetiopathogenesis, investigations and management
Desirable to know:
Unusual complications of hyperemesis and management

9. Antepartum haemorrhage
Must know:
Classification, clinical features, differential diagnosis, investigation including USG features, management and complications
Desirable to know:
Management of Complications like DIC

10. Malpresentations and malpositions and CPD
Must know:
Causes, clinical findings, definitive diagnosis of malpresentations and malpositions and mechanism of labour in such cases
Causes of contracted pelvis and diagnosis and management
Diagnosis of CPD and Trial of labour
Definition of Obstructed labour and rupture uterus, causes, clinical features and management. Prevention of rupture uterus
Desirable to know:
Various types of Pelvis

11. Multiple pregnancy
Must know:
Causes, diagnosis, differential diagnosis, complications in pregnancy and labour and management
Desirable to know:
Mechanism of twin to twin transfusion and management
Management of single fetal demise

12. Hydramnios and oligohydramnios
Must know:
Causes, diagnosis, investigations and management
Desirable to know:
Recent trends in management

13. Hypertensive disorders of Pregnancy
Must know:
Classification, diagnosis, investigations and management of Gestational hypertension, pre-eclampsia, and Eclampsia and complications
Predictive tests & Prevention of pre-eclampsia and Eclampsia
Desirable to know:
Management of complications of Hypertensive disorders and chronic hypertension and renal disease
Differential diagnosis of convulsions in a pregnant woman

14. Anaemia during pregnancy

Must know
- Causes, classification of various types of anaemias and their diagnosis,
- Nutritional anaemias and their management. Prevention of anaemia

Desirable to know
- Management of Non-nutritional anaemias in pregnancy

15. Diabetes mellitus and pregnancy

Must know
- Classification, Diagnosis, Screening for GDM and management of Diabetes during pregnancy and labour
- Management of neonate of diabetic mother

Desirable to know
- Complications of diabetes and their management

16. Heart disease and pregnancy

Must know
- Classification, evaluation, complications during pregnancy and labour
- Contraception

Desirable to know
- Surgical management during pregnancy

17. Intrauterine- Growth restriction and Intra uterine death

Must know
- Causes, diagnosis and management

Desirable to know
- Recent advances in management

18. Infections during pregnancy

Must know
- UTI, Malaria, Syphilis, Tuberculosis, Hepatitis, HIV and TORCH infections during pregnancy and their management

19. Preterm labour and Post-dated pregnancy

Must know
- Causes, diagnosis and principles of management of preterm labour and delivery
- Evaluation and management of Post-dated pregnancy
- Neonatal problems of Preterm and post-term babies
- Prevention of Preterm labour, Various Tocolytics

20. Rh Negative Pregnancy

Must know
- Diagnosis, evaluation and management
- Prevention of Rh Isoimmunisation
- Management of Haemolytic disease of New born

Desirable to know
- In-utero management of Rh iso-immunised fetus

21. Normal labour

Must know
- Physiology, mechanism and conduct of normal labour
- Monitoring in various stages and abnormal labour or dysfunctional labour
- Diagnosis and management of fetal distress
- Pain relief during labour
- Active management of third stage of labour and complications of IIIrd stage

22. Postpartum haemorrhage

Must know
- Definition, types, Diagnosis and management of PPH.
- Retained placenta, Manual removal of placenta

Desirable to know
- Management of Inversion of uterus

23. Induction/Augmentation of labour

Must know
- Pre-requisites for induction
- Various methods of cervical ripening
- Successful induction and failed induction
Complications and contra-indications for induction
Various methods /drugs for augmentation of labour
24. Operative Obstetrics
Must know
Indications, technique & complications of episiotomy
Indications, technique and complications of Caesarean section,
Forceps and vacuum deliveries
Assisted breech delivery and Breech extraction
Methods of Tubectomy complications and failure rates
Cervical cerclage
Desirable to know
Destructive operations in Obstetrics
25. Post-caesarean pregnancy
Must know
Evaluation of a case of post-caesarean pregnancy and management
Monitoring of a case of post-caesarean in labour and complications of VBAC
Indications for repeat Caesarean section and complications of Caesarean at
repeat CS
26. Puerperium
Must know
Course of Normal Puerperium and complications of Puerperum like Puerperal
sepsis and its diagnosis and management and prevention
Breastfeeding and common problems like lactational failure
Care of neonate and infant and Immunisation schedule
27. Contraception
Must know
Cafeteria approach, various methods of contraception, advantages and side-
effects, and failure rates, Selection of patients and counselling
IUCD Insertion and removal. Emergency contraception
Desirable to know
Implants
28. Medical termination of Pregnancy
Must know
MTP Act, Indications, Contraindications, Various methods of First trimester and
Second trimester termination and their complications
Concurrent contraception
Desirable to know
Management of complications of various methods of MTP
29. Perinatal and Maternal mortality in INDIA
Must know
Definition of PNMR & MMR. causes and prevention of Perinatal and maternal
mortality
Desirable to know
PNMR & MMR in our Institute and Puducherry

GYNAECOLOGY

1. Vaginal discharge
Must know
Physiological and pathological causes of vaginal discharge
Clinical characteristics, Investigations for diagnosis, predisposing conditions and
management
2. Amenorrhoea
Must know
Classification of Primary and Secondary amenorrhoea, investigations and
principles of management
Desirable to know
Details of management.
3. Abnormal uterine bleeding
Must know
Normal menstrual pattern and physiology of menstrual cycle
Various bleeding patterns like menorrhagia, metrorrhagia and polymenorrhoea
- Causes, investigations, diagnosis of AUB
Definition, Etiology and classification of DUB and its management
Desirable to know
Transvaginal sonography and sonosalpingography

4. Infertility
Must know
Definition of Infertility and sterility
Causes and investigation of a couple with infertility; semen analysis
Causes of anovulation and induction of ovulation, Tests for ovulation & tubal patency, Management of tubal factors of infertility including re-canalisation,
Counseling for ART
Desirable to know
ART and their success

5. Pelvic organ prolapse
Must know
Classification, causes, diagnosis, investigations and management in relation to age and parity.
Preventive aspects of pelvic organ prolapse
Desirable to know
Nulliparous prolapse

6. Urinary incontinence
Must know
Classification and differential diagnosis
Investigations and management of Stress urinary incontinence
Desirable to know
Surgical therapy of Stress urinary incontinence

7. Benign tumours of Internal reproductive organs
Must know
Causes, Investigations, complications and management of fibroid uterus, Ovarian cysts, Endometriosis
Desirable to know
Conservative surgery and recent advances in management

8. Uterine anomalies
Must know
Classification and diagnosis and reproductive outcome and indications for surgical management
Desirable to know
Surgical procedures for specific anomalies

9. Pelvic Inflammatory disease
Must know
Definition, causes, sequelae and management of PID
Sexually transmitted infections and their prevention
Genital tuberculosis diagnosis and management (in detail)
Prevention of PID

10. Genital tract injuries and Genital fistulae
Must know
Post-coital injuries, and operative injuries especially to urinary tract
Causes, clinical features and diagnosis of genital fistulae and their management
Desirable to know
Operative techniques and complications

11 Pre-malignant lesions and Malignancies of genital tract
Must know
Etiology and Pathology, Classification, diagnosis of pre-malignant and malignant lesions of vulva, vagina, Cervix, uterus and ovary
Screening for carcinoma cervix
Clinical and Surgicopathological Staging and principles of management of cervical, endometrial cancer and ovarian cancer
Desirable to know
Screening for Breast and endometrial and ovarian malignancies
Chemotherapy and Radiotherapy of Carcinoma cervix including adverse effects
Chemotherapy of Ovarian cancer

**11. Problems of Adolescence and menopause**

Must know
Menopausal symptoms and management of menopause, HRT
Causes and investigations of post-menopausal bleeding

Desirable to know
Precocious puberty causes and investigation
Management of Precocious puberty

**12. Operative Gynaecology**

Must know
Indications, technique and complications of Dilatation and Curettage and Fractional curettage, Vaginal hysterectomy, Ward Mayo’s operation, Manchester repair, Abdominal Hysterectomy, Ovariotomy. Tubal recanalisation and diagnostic laparoscopy
Staging laparotomy for endometrial and ovarian malignancy
Diagnosis and principles of management of post-operative complications

Desirable to know
Indications and techniques of Colposcopy, Hysteroscopy and operative laparoscopy
Detailed management of various post-operative complications

**SKILLS**

1. **Communication skills**
   Must acquire
   - History taking skills- Present and past Obstetric history
   - History of Medical and Surgical disorders if any
   - Family history and treatment history
   - Counseling for contraception, Breast feeding
   
   Desirable to acquire

2. **Clinical skills**
   Must acquire
   - A. General Physical examination and Systemic Examination
   - B. Obstetric examination
     - Speculum and vaginal examination
     - Diagnosis of early pregnancy
     - Measurement of symphysio fundal height
     - Plotting Gravidogram to monitor fetal growth
     - Obstetric palpation to know the lie, Presentation and position of fetus
     - Pelvic assessment to know grossly contracted pelvis
   - C. Diagnosis and Monitoring Labour
     - Appreciate Normal Uterine contractions by palpation
     - Fetal heart normality
     - Cervical dilatation
     - Station of presenting part
     - Plotting a Partogram and recognition of deviations from normal
     - Catherisation of bladder during labour
   - Technique of ARM
   - Conduct of normal labour including active management of III stage
   - Technique of Episiotomy and its suturing
   - Recognition of Perineal tears and suturing
   - Exploration of Genital tract for injuries after delivery
   - Care of Normal New-born and resuscitation of asphyxiated New-born
   
   Desirable to acquire
   - Techniques of Assisted breech delivery and breech extraction
   - Vacuum application and extraction
   - Out-let forceps application
   - Repair of cervical tears
   - Vaginal packing
D. Gynaecological examination

**Must acquire**
- Inspection and recognition of various parts of external genitalia
- Recognition of perineal body and anus
- Per speculum examination and recognition of Unhealthy cervix and growth on cervix
- Technique of Pap smear collection
- Bimanual pelvic examination to know the size and position of uterus and presence and absence of adnexal mass
- Identification of cystocele, rectocele and enterocele and descent of cervix
- Technique of rectal examination
- Technique of cervix biopsy
- Technique of Schiller’s test and acetic acid test
- Technique of IUCD insertion and removal

**Desirable to acquire:**
1. Culdocentesis
2. Instrumental evacuation for incomplete abortion
3. Blood transfusion
4. Adult resuscitation

**Managerial skills**

**Must know**
- Transport of patient with convulsions, and Shock
- How to co-ordinate with team members

**Desirable to know**
- Organisation of antenatal clinics and arrangement for cervical cancer screening at camps

**Recommended Books**

**Latest editions of the following books are recommended**

**Obstetrics:**
1. Manual of Obstetrics, Edited by Daftary SN, and Daftary GS Published by Elsevier, New Delhi, India.

**Gynaecology:**
1. Howkins & Bourne Shaw’s Text book of Gynaecology edited by Padubidri VG and Daftary SN Published by Elsevier
3. Mudaliar and Menon’s Clinical Obstetrics Edited by Gopalan Sarala and Jain Vanita Published by Orient Longman, Chennai, INDIA.

**Clinical books:**
3. Shaw’s Text book of Operative Gynaecology Revised by Hudson CN and Setchell ME Published by Reed Elsevier India Pvt., Ltd.
4. Practical Gynaecology and Obstetrics edited by Parulekar SV Published by Vora medical Publications.
EXAMINATION REGULATIONS

DISTRIBUTION OF MARKS
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 inclusive of attendance in non lecture teaching, i.e. seminars, group discussions, tutorials, demonstrations, practicals, Hospital (Tertiary, Secondary, Primary) postings and bedside clinics, etc.

For appearing at the University Examination, student should have 75% attendance in each subject even if shortage seen in one subject, he/she will be detained for the entire examination. Students cannot appear separately to the individual subjects during the first appearance at the Professional examination.

(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 as given in the working sheet.

Student must secure at least 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.

(3) UNIVERSITY EXAMINATIONS:
Theory (Nature of questions will be short answer type / objective type and marks for each parat 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.

Scrutiny of theory question papers received from Paper Setters: 
- In order to ensure uniformity and minimum standards acceptable for evaluation, a Vetting Committee be constituted by the Vice-Chancellor for various subjects in the Pre, Para-Clinical, Part I and Part II Clinical phases of MBBS Examination.

Criteria for passing the examination
- Candidate has to pass separately in theory + Viva and Practical / Clinical by getting a minimum of 50% marks in the combined Internal Assessment and University Examination. It is further subject to the condition that candidate should obtain a minimum of 40% marks in University theory examination and minimum of 50% marks in University Practical / Clinical examination.
- The marks of the record submitted to be added to the practical internal assessment.
- Two notified tests per Semester and the Send-up test is compulsory. This is to be uniformly followed in all the subjects up to the end of the course. The computation of the internal assessment is based on N-1 principle followed hitherto previously, where N is number of notified tests.
- To make uniform standardized 100 marks of 3 hours duration with two sections for each theory paper of the various subjects. The total marks in Theory paper will be inclusive of Internal Assessment (20%) computed through various notified tests.

Minimum marks for declaration of pass

<table>
<thead>
<tr>
<th></th>
<th>University (Minimum)</th>
<th>Internal Assessment</th>
<th>University + Int. Assessment aggregate + Viva</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theory</td>
<td>40%</td>
<td>35%</td>
<td>50%</td>
</tr>
<tr>
<td>Practical / Clinical</td>
<td>50%</td>
<td>35%</td>
<td>50%</td>
</tr>
</tbody>
</table>

*Viva marks should be added to the theory marks and not to the Practical/Clinical marks

Grace Mark in case of failure in ONE out of all subjects for the particular semester

A passing board is constituted for finalizing the results of each phase. The Heads of the Departments or the members, the board allots grace marks maximum 5 for one subject. The grace mark of 5 will be added for one subject only after the marks obtained in the University examination are scaled down to 100% in the particular subject – Theory. The grace mark of 5 is applicable to all the University examinations of MBBS conducted semester-wise. No Grace marks will be added for Practical. This will not be applicable when the candidate takes up a single subject in the University Examination.
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 ascertain whether the candidate has acquired the necessary for knowledge, minimum skills along with 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 Appendix-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 be held 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 Professional :-

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.
DISTRIBUTION OF MARKS TO VARIOUS DISCIPLINES:

(A) FIRST PROFESSIONAL EXAMINATION: (Pre-clinical Subjects):

(a) **Anatomy:**
- Theory: Two papers of 80 marks each - 160 marks.
- Oral (Viva): 20 marks
- Practical: 100 marks
- Internal Assessment: (Theory-40; Practical-30 includes 5 marks for Record) 70 marks
- Total: 350 marks

(b) **Physiology including Biophysics**
- Theory: Two papers of 80 marks each - 160 marks.
- Oral (Viva): 20 marks
- Practical: 100 marks
- Internal Assessment: (Theory-40; Practical-30 includes 5 marks for Record) 70 marks
- Total: 350 marks

(c) **Biochemistry:**
- Theory: Two papers of 80 marks each - 160 marks.
- Oral (Viva): 20 marks
- Practical: 100 marks
- Internal Assessment: (Theory-40; Practical-30 includes 5 marks for Record) 70 marks
- Total: 350 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. In addition, the candidate should also obtain minimum of 40% in University Theory Examination.
Working sheet for the First Professional examination

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Description</th>
<th>Anatomy</th>
<th>Physiology</th>
<th>Biochemistry</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>No of Theory Papers</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>Marks for each Theory Paper</td>
<td>80</td>
<td>80</td>
<td>80</td>
</tr>
<tr>
<td>3</td>
<td>Total marks for Theory Paper</td>
<td>160</td>
<td>160</td>
<td>160</td>
</tr>
<tr>
<td>4</td>
<td>Minimum marks for Theory Paper</td>
<td>64</td>
<td>64</td>
<td>64</td>
</tr>
<tr>
<td>5</td>
<td>Practical marks</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>6</td>
<td>Oral</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>7</td>
<td>Passing minimum for Practical/</td>
<td>50</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Internal Assessment**
  - Theory: 40, Practical 25 & Record 5
  - Theory: 40, Practical 25 & Record 5
  - Theory: 40, Practical 25 & Record 5

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Description</th>
<th>Part A</th>
<th>Part B</th>
<th>Part A</th>
<th>Part B</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>Total Marks</td>
<td>220</td>
<td>130</td>
<td>220</td>
<td>130</td>
</tr>
</tbody>
</table>

Total marks = Part A (Univ. Theory + Int. Assess. Theory + Oral)
Part B (Univ. Pract. + Int. Assess. Practical)

The candidate has to pass individually in Part A and Part B. Passing minimum is 50% aggregate in each part. In addition the candidate has to obtain in University Theory Examination - 40% minimum and in University Practical Examination - 50% minimum.

If the candidate fails in one part, he has to appear for both the Parts of the concerned subject.

(A) SECOND PROFESSIONAL EXAMINATION;
(Para-clinical subjects):

(a) **Pathology**:
- Theory: Two papers of 80 marks each - 160 marks.
- Oral (Viva): 20 marks
- Practical: 100 marks
- Internal Assessment (Theory-40; Practical-30 includes 5 marks for Record) 70 marks
  Total 350 marks

(b) **Microbiology**:
- Theory: Two papers of 80 marks each - 160 marks.
- Oral (Viva): 20 marks
- Practical: 100 marks
- Internal Assessment (Theory-40; Practical-30 includes 5 marks for Record) 70 marks
  Total 350 marks

(c) **Pharmacology**:
- Theory: Two papers of 80 marks each - 160 marks.
- Oral (Viva): 20 marks
- Practical: 100 marks
- Internal Assessment (Theory-40; Practical-30 includes 5 marks for Record) 70 marks
  Total 350 marks

(d) **Forensic Medicine**
- Theory: One paper 80 marks
- Oral (Viva): 20 marks
- Practical/Clinicals: 50 marks
- Internal assessment (Theory-20; Practical-30 includes 5 marks for record) 50 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. In addition, the candidate should also obtain minimum of 40% in University Theory Examination.

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Description</th>
<th>Pathology</th>
<th>Microbiology</th>
<th>Pharmacology</th>
<th>Forensic Medicine</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>No of Theory Papers</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
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<td>2</td>
<td>Marks for each Theory Paper</td>
<td>80</td>
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<tr>
<td>3</td>
<td>Total marks for Theory Paper</td>
<td>160</td>
<td>160</td>
<td>160</td>
<td>80</td>
</tr>
<tr>
<td>4</td>
<td>Minimum marks for Theory Paper</td>
<td>64</td>
<td>64</td>
<td>64</td>
<td>32</td>
</tr>
<tr>
<td>5</td>
<td>Practical marks</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>50</td>
</tr>
<tr>
<td>6</td>
<td>Oral</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>7</td>
<td>Passing minimum for Practical/</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>25</td>
</tr>
<tr>
<td>8</td>
<td>Internal Assessment</td>
<td>Theory 40, Practical 25 &amp; Record 5</td>
<td>Theory 40, Practical 25 &amp; Record 5</td>
<td>Theory 40, Practical 25 &amp; Record 5</td>
<td>Theory 20, Practical 25 &amp; Record 5</td>
</tr>
</tbody>
</table>

Total marks – Part A (Univ. Theory + Int. Assess. Theory + Oral)
Part B (Univ. Pract. + Int. Asses. Practical)
The candidate has to pass individually in Part A and Part B. Passing minimum is 50% aggregate in each part. In addition the candidate has to obtain in University Theory Examination - 40% minimum and in University Practical Examination - 50% minimum.
If the candidate fails in one part, he has to appear for both the Parts of the concerned subject.

**Working sheet for the Second Professional examination**

(d) **THIRD PROFESSIONAL**

(i) **PART 1 (Clinical subjects)**

Part 1: To be conducted during end period of seventh semester

(a) **Ophthalmology:**
- Theory-one paper: 80 marks
- Oral (Viva): 20 marks
- Practical/Clincials: 50 marks
- Internal assessment (Theory-20; Practical-30 includes 5 marks for record): 50 marks
  - Total: 200 marks

(b) **Oto-Rhino-Laryngology :**
- Theory-one paper: 80 marks
- Oral (Viva): 20 marks
- Practical/Clincials: 50 marks
- Internal assessment (Theory-20; Practical-30 includes 5 marks for record): 50 marks
  - Total: 200 marks

(c) **Community Medicine including Humanities:**
- Theory-Two papers of 80 marks each: 160 marks.
- Oral(Viva): 20 marks
**Practical** 100 marks

**Internal Assessment**
(Theory-40; Practical-30 includes 5 marks for Record) 70 marks
Total 350 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. In addition, the candidate should also obtain minimum of 40% in University Theory Examination.

**Working sheet for the Third Professional Part I examination**

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Description</th>
<th>Ophthalmology</th>
<th>Oto-rhino-laryngology</th>
<th>Community Medicine including Humanities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>No of Theory Papers</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>Marks for each Theory Paper</td>
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<td>80</td>
</tr>
<tr>
<td>3</td>
<td>Total marks for Theory Paper</td>
<td>80</td>
<td>80</td>
<td>160</td>
</tr>
<tr>
<td>4</td>
<td>Minimum marks for Theory Paper</td>
<td>32</td>
<td>32</td>
<td>64</td>
</tr>
<tr>
<td>5</td>
<td>Practical/Clinical marks</td>
<td>50</td>
<td>50</td>
<td>100</td>
</tr>
<tr>
<td>6</td>
<td>No of Long cases and marks</td>
<td>Nil</td>
<td>Nil</td>
<td>Clinico-social case discussion 60 marks Stat. / Epidem. Exercises – 20 marks</td>
</tr>
<tr>
<td>7</td>
<td>No of short cases and marks</td>
<td>2 x 20 = 40 Spotters 2x5=10</td>
<td>2 x 20 = 40 Spotters 2x5=10</td>
<td>Spotters – 20 marks</td>
</tr>
<tr>
<td>8</td>
<td>Oral</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>9</td>
<td>Passing minimum for Practical / Clinical</td>
<td>25</td>
<td>25</td>
<td>50</td>
</tr>
<tr>
<td>10</td>
<td>Internal Assessment</td>
<td>Theory 20, Practical 25 &amp; Record 5</td>
<td>Theory 20, Practical 25 &amp; Record 5</td>
<td>Theory 40, Practical 25 &amp; Record 5</td>
</tr>
<tr>
<td></td>
<td>Total Marks</td>
<td>Part A = 120 Part B = 80</td>
<td>Part A = 120 Part B = 80</td>
<td>Part A = 220 Part B = 130</td>
</tr>
</tbody>
</table>

The candidate has to pass individually in Part A and Part B. Passing minimum is 50% aggregate in each part. In addition the candidate has to obtain in University Theory Examination - 40% minimum and in University Practical Examination - 50% minimum

If the candidate fails in one part, he has to appear for both the Parts of the concerned subject.
PART-II

(a) **Medicine:**

Paper I - General Medicine
Paper II - General Medicine (including Psychiatry, Dermatology and S.T.D.)
(Shall contain one question on basic sciences and allied subjects)
Theory - Two papers of 80 marks each - 160 marks.
Oral (Viva) - 20 marks
Practical - 100 marks
Internal Assessment
(Theory-40; Practical-30 includes 5 marks for Record) 70 marks
Total 350 marks

(b) **Surgery:**

Paper I-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)
Theory - Two papers of 80 marks each - 160 marks.
Oral (Viva) - 20 marks
Practical - 100 marks
Internal Assessment
(Theory-40; Practical-30 includes 5 marks for Record) 70 marks
Total 350 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**

Paper I- Obstetrics including social obstetrics.
Paper II – Gynaecology, Family Welfare and Demography
(Shall contain one question on basic sciences and allied subjects)
Theory - Two papers of 80 marks each - 160 marks.
Oral (Viva) - 20 marks
Practical - 100 marks
Internal Assessment
(Theory-40; Practical-30 includes 5 marks for Record) 70 marks
Total 350 marks

(d) **Pediatrics : (Including Neonatology)**

Theory-one paper - 80 marks
Oral (Viva) - 20 marks
Practical / Clinicals - 50 marks
Internal assessment
(Theory-20; Practical-30 includes 5 marks for record) 50 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. In addition, the candidate should also obtain minimum of 40% in University Theory Examination.
### Working sheet for the Third Professional Part II examination

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Description</th>
<th>Medicine</th>
<th>Surgery</th>
<th>Obst &amp; Gynae</th>
<th>Paediatrics *</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>No of Theory Papers</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Marks for each Theory Paper</td>
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<td>80</td>
<td>80</td>
<td>80</td>
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<tr>
<td>3</td>
<td>Total marks for Theory Paper</td>
<td>160</td>
<td>160</td>
<td>160</td>
<td>80</td>
</tr>
<tr>
<td>4</td>
<td>Minimum marks for Theory Paper</td>
<td>64</td>
<td>64</td>
<td>64</td>
<td>32</td>
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<tr>
<td>5</td>
<td>Practical/Clinical marks</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>50</td>
</tr>
<tr>
<td>6</td>
<td>No of Long cases and marks</td>
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<td>1</td>
<td>Obst – 1</td>
<td>Nil</td>
</tr>
<tr>
<td></td>
<td></td>
<td>40 marks</td>
<td>40 marks</td>
<td>40 marks</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>No of short cases and marks</td>
<td>3x20 = 60 marks</td>
<td>3x20 = 60 marks</td>
<td>Nil</td>
<td>2 x 20 = 40 spotters 2 x 5 = 10</td>
</tr>
<tr>
<td>8</td>
<td>Oral</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>9</td>
<td>Passing minimum for Practical/</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>25</td>
</tr>
<tr>
<td>10</td>
<td>Internal Assessment</td>
<td>Theory 40, Practical 25 &amp; Record 5</td>
<td>Theory 40, Practical 25 &amp; Record 5</td>
<td>Theory 40, Practical 25 &amp; Record 5</td>
<td>Theory 20, Practical 25 &amp; Record 5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total Marks</td>
<td>Part A = 220 Part B = 130</td>
<td>Part A = 220 Part B = 130</td>
<td>Part A = 220 Part B = 130</td>
<td>Part A = 120 Part B = 80</td>
</tr>
</tbody>
</table>

Total marks = Part A (Univ. Theory + Int. Assess. Theory + Oral)  
Part B (Univ. Pract. + Int. Assess. Practical)  
The candidate has to pass individually in Part A and Part B. Passing minimum is 50% aggregate in each part. In addition the candidate has to obtain in University Theory Examination - 40% minimum and in University Practical Examination - 50% minimum  
If the candidate fails in one part, he has to appear for both the Parts of the concerned subject

---

### GRACE MARK

**Grace Mark in case of failure in ONE out of all subjects for the particular semester**

A passing board is constituted for finalizing the results of each phase. The Heads of the Departments or the members, the board allots grace marks maximum 5 for one subject. The **grace mark of 5 will be added for one subject only after the marks obtained in the University examination are scaled down to 100% in the particular subject – Theory.** The grace mark of 5 is applicable to all the University examinations of MBBS conducted semester-wise. **No Grace marks will be added for Practicals.**  
Grace Mark will not be applicable when the candidate takes up the University Examination in a compartmental manner.
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 at least 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.

(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.
INTERNSHIP
CHAPTER - V

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.

(2) **Specific 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-economic, 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

<table>
<thead>
<tr>
<th>Subject</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community Medicine</td>
<td>2 months</td>
</tr>
<tr>
<td>Medicine including 15 days of Psychiatry</td>
<td>2 months</td>
</tr>
<tr>
<td>Surgery including 15 days Anaesthesia</td>
<td>2 months</td>
</tr>
<tr>
<td>Obst./Gynae. Including Family Welfare Planning</td>
<td>2 months</td>
</tr>
<tr>
<td>Paediatrics</td>
<td>1 month</td>
</tr>
<tr>
<td>Orthopaedics including PMR</td>
<td>1 month</td>
</tr>
<tr>
<td>E.N.T.</td>
<td>15 days</td>
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<tr>
<td>Ophthalmology</td>
<td>15 days</td>
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<tr>
<td>Casualty</td>
<td>15 days</td>
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</tbody>
</table>

Elective posting (1 x 15 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 outreach 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 completion 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, | SCORE 0-5 |
| b) of having assisted in procedures, | |
| c) of having observed. | |

(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

<table>
<thead>
<tr>
<th>poor</th>
<th>Fair/ Below</th>
<th>Average/ Above</th>
<th>Excellent</th>
</tr>
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</table>
(6) 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 its declaration that the candidate is eligible for it.

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

(9) **INTERNSHIP – DISCIPLINE RELATED:**

**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) **TALUKA 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.

(II) 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.)

(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.
(IV) 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 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 anaphylactic 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 asthmaticus;
(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) ear syringing antrum puncture and packing of the nose for epistaxis,
   (b) nasal douching and packing of the external canal,
   (c) remove the foreign bodies from the nose and ear
   (d) observed or assisted in various endoscopic 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, cataract, 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:
   a) Subconjunctival injection;
   b) Ocular bandaging;
   c) Removal of concretions;
   d) Epilation and electroysis;
   e) Corneal foreign body removal;
   f) Cauterization of corneal ulcers;
   g) Chalazion removal;
   h) Entropion correction;
   i) Suturing conjunctival tears;
   j) Lids repair
   k) Glaucoma surgery (assisted);
   l) 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 skills 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 congenital deformities such as congenital talipes equinovarus (CTEV) and dislocation of hip (CDH).

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

(a) Splitting (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’ 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 bedside 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:

a) perform pre-anaesthetic check up and prescribe pre-anaesthetic medications;
b) perform venepuncture and set up intravenous drip;
c) perform laryngoscopy and endotracheal intubation;
d) perform lumbar puncture, spinal anaesthesia and simple nerve blocks;
e) conduct simple general anesthetic procedures under supervision;
f) monitor patients during anaesthesia and post operative period;
g) recognise and manage problems associated with emergency anaesthesia;
h) maintain anaesthetic records;
i) recognise and treat complication in post operative period;
j) perform cardio-pulmonary brain resuscitation (C.P.B.R.) correctly, 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.
APPENDICIES
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**
   i) Gross and microscopic anatomy of the male and female generative organs.
   ii) The menstrual cycle.
   iii) Spermatogenesis and Oogenesis
   iv) Fertilization of the ovum.
   v) Tissue and organ changes in the mother in pregnancy.
   vi) Embryology and Organogenesis.
   vii) Principles of Genetics.
   viii) 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**
   i) Physiology of reproduction.
   ii) Endocrines and regulations of reproduction in the female
   iii) Endocrines and physiology of reproduction in the male.
   iv) Physiology and Endocrinology of pregnancy, parturition and lactation.
   v) Nutritional needs of mother and child during pregnancy and lactation.
   vi) The safe period-rhythm method of contraceptions.
   vii) Principles of use of oral contraceptive.

3. **Pharmacology**
   i) Mode of action and administration of:
      a) Chemical contraceptive
      b) Oral contraceptive
   ii) Contra indication for administration of contraceptives.
   iii) Toxic effects of contraceptives.

4. **Community Medicine**
   i) The need for family welfare Planning.
   ii) Organization of Family Welfare Planning service.
   iii) Health Education in relating to Family Welfare Planning.
   iv) Nutrition.
   v) Psychological needs of the mother, the child and the family.
   vi) Demography and vital Statistics.

5. **Obstetrics & Gynaecology**
   i) Contraceptive methods in male/female.
      a) Mechanical
         i) Pessaries, Intra Uterine Contraceptive Device (IUCD), Condoms,
         ii) Tubectomy and vasectomy
      (b) Chemical
      (c) Oral
      (d) Rhythm Method
   ii) Demonstrations of use of Pessaries, IUCD, Condoms and technique of tubectomy
   iii) Advice on family planning to be imparted to parents.

6. **Paediatrics**
   i) 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. However, 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, Paediatrics 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:

I. 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 urinary 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.

V. 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 antenatal 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
entreprise efforts for the health care;
(b) To be able to carry on managerial responsibilities, e.g.Management 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.
XIII. 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 I - 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)

Teaching of para-clinical subjects shall be 4 hrs per day in 3rd Hrs Semester and 3 Hrs 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)

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**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-specialties. 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.
Clinical methods in Medicine and Surgery for whole class will be for 2 weeks each respectively at the start of 3rd semester.
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 includes maternity training and Family medicine and the 3rd semester posting shall be in Family Welfare Planning.

**PHASE –II**

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

FIRST PROFESSIONAL MODEL QUESTION PAPERS

ANATOMY

PAPER I

Time: 3 hours  Max. Marks: 80

ANSWER ALL QUESTIONS

Each Section to be answered in separate Answer Book
Illustrate your answer with suitable diagrams

SECTION A

General Anatomy, Gross Anatomy-Upper limb, Lower limb, General Histology, General Embryology and Medical Genetics

1. What is the normal neck-shaft angle of femur? Mention the conditions in which it gets deviated and add a note on its arterial supply.  
   (2+4+4=10 marks)

2. Explain briefly  
   (3 x 5 = 15 marks)
   a. Abduction of shoulder joint & Scapulohumeral rhythm
   b. Mechanism of locking at knee joint
   c. Fascial spaces of hand
   d. Placental barrier
   e. X-chromosome inactivation

3. Write short notes on  
   (3 x 5 = 15 marks)
   a. Twinning
   b. Myelinated and unmyelinated axons
   c. Structure and function of bursa
   d. Erb’s point
   e. Myoepithelial cell

SECTION B

Abdomen, Pelvis & Perineum, Systemic Histology, Systemic Embryology

4. What is processes vaginalis of Testes? How does this lead for development of congenital indirect inguinal hernia and hydrocele?  
   (2+4+4=10 marks)

5. Explain Why / How  
   (3 x 5 = 15 marks)
   a. Formation of esophageal varices occur in condition of portal vein obstruction
   b. Bare area of liver gets arterial supply through inferior phrenic artery
   c. Falciform ligament and lesser omentum are regarded as parts of ventral mesogastrium
   d. Seepage of urine occurs through umbilicus
   e. Mucosal and submucosal changes occur in small intestine from proximal to distal

6. Write short notes on  
   (3 x 5 = 15 marks)
   a. Pudendal block
   b. Congenital meegacolon
   c. Microscopic structure of macula densa
   d. Hassall’s corpuscles
   e. Formation of caput medusae
ANATOMY

PAPER II

Time: 3 hours
Max. Marks: 80

ANSWER ALL QUESTIONS

Each Section to be answered in separate Answer Book
Illustrate your answer with suitable diagrams

SECTION A

Thorax, Brain & Spinal cord, Systemic Histology (Thorax & Brain), Systemic Embryology (Thorax & Brain), Post natal growth & Development

1. Describe the relations branches and normal development of arch of Aorta. Mention the arteries that take part in collateral circulation in condition such as Coarctation of Aorta of post ductal type. (2+4+4=10 marks)

2. Explain briefly (3 x 5 = 15 marks)
   a) Pial components of spinal cord
   b) Vascular supply of interventricular septum
   c) Cerebellar cortex
   d) Telachoroidea of 4th ventricle

3. Write short notes on (3 x 5 = 15 marks)
   a) Broncho pulmonary segments
   b) Azygos vein
   c) Milestones of one year
   d) Alar and basal plate
   e) Lumbar puncture

SECTION B

Head & Neck, Systemic Histology and Systemic Embryology

4. Describe the position, relations and fiber composition of sublentiform and retrolentiform parts of Internal capsule. Add a note on its arterial supply. (2+4+4=10 marks)

5. Explain briefly (3x 5 = 15 marks)
   a) Killian’s dehiscence of constrictor muscle of pharynx
   b) Layers of scalp and applied significance of each
   c) Auriculo temporal nerve syndrome
   d) Pre ganglionic and post ganglionic connections of Ciliary and Submandibular ganglion
   e) Histological components of blood acqueous barrier with a clinical importance.

6. Write short notes on (3 x 5 = 15 marks)
   a) Microscopic structure taste bud
   b) Branchial cyst
   c) Movements of Vocal cords and muscles acting on it
   d) Neuro vascular relations of thyroid gland
   e) Medial wall of middle ear cavity
PHYSIOLOGY

PAPER I

Time: 3 hours  
Max. Marks: 80

ANSWER ALL QUESTIONS

Each Section to be answered in separate Answer Book
Illustrate your answer with suitable diagrams

SECTION A

(General Physiology, Blood, Nerve and Muscle, ANS and GI system)

1. Name the clotting factors. With the help of a schematic diagram, explain the mechanism of blood coagulation. (2+8=10 marks)

2. (3 x 5 = 15 marks)
   a) With the help of a suitable diagram, briefly describe the molecular basis of skeletal muscle contraction.
   b) Classify lymphocytes. Briefly describe the mechanism of cellular immunity
   c) With the help of a suitable diagram, describe the mechanism of hydrochloric acid secretion in stomach.
   d) Classify the processes of transport across cell membrane. Briefly explain the mechanism of action of Na\(^+\) - K\(^+\) pump
   e) List the steps of erythropoiesis. Briefly describe the regulation of erythropoiesis.

3. (3 x 5 = 15 marks)
   a) A female patient of 40 years age complains of drupping of eye-lid and general weakness and fatigue that aggravates towards evening, but improves after rest or sleep. What could be your provisional diagnosis and what is the nature of dysfunction? Name one investigation (and its finding) to confirm your diagnosis. Give the physiological basis of use of a drug in this condition.
   b) A newborn baby delivered from an Rh negative mother had severe anemia, jaundice, generalized swelling of the body and some degree of motor deficits. What is the probable condition and what could be the possible cause of the dysfunction? Briefly mention the physiological basis of treatment of the dysfunction. How will you prevent this dysfunction to occur in subsequent pregnancy of the same mother?
   c) Explain, why is dehydration common and usually fatal (if not treated immediately) in children. Why are sodium and glucose important components of oral rehydration solution?
   d) List three important features each for regenerative and regenerative changes in a nerve following injury
   e) A patient with history of chronic gastritis developed severe anemia. What are the possible pathophysiological bases of anemia in this condition and what is the possible physiological basis of management?
SECTION B

Endocrine Physiology, Physiology of Reproduction and Renal system)

4. Name the hormones secreted from adrenal glands. Describe various functions of cortisol. (2+8=10 marks)

5. (3 x 5 = 15 marks)
   a) With the help of a schematic diagram, describe the mechanisms of increase in cardiac output by thyroid hormones
   b) With the help of a suitable diagram, briefly describe the uterine, ovarian and hormonal changes in different phases of menstrual cycle
   c) With the help of suitable diagrams, briefly describe the counter-current mechanisms of acidification of
   d) With the help of a suitable diagram, describe the mechanism of glomerular filtration
   e) List the hormones that influence calcium metabolism. Briefly describe the function of any one major hormone controlling plasma calcium concentration.

6. (3 x 5 = 15 marks)
   a) A patient of 40 years age complains of polyphagia, polydipsia and polyuria. What could be your provisional diagnosis and how will you establish your diagnosis? How will you differentiate it from other major cause of polyuria? Give the physiological basis of use of a drug in this condition
   b) A patient complains of loss of control on his micturition following recovery from a spinal injury. What could be the nature of bladder dysfunction and what is the cause of this dysfunction? What investigation you would like to perform to confirm the nature of bladder dysfunction
   c) What advice you would like to give to a newly married couple not desirous of children for two years? Briefly explain the mechanism of action of this contraceptive method
   d) A patient following thyroid surgery developed carpopedal spasm and laryngospasm. What is the possible cause of these dysfunctions and what is the physiological basis of its management?
   e) Briefly explain the mechanism and importance of tubuloglomerular feedback.
PHYSIOLOGY

PAPER II

Time: 3 hours

Max. Marks: 80

ANSWER ALL QUESTIONS

Each Section to be answered in separate Answer Book
Illustrate your answer with suitable diagrams

SECTION A

(Cardiovascular System, Respiratory system and Environmental physiology)

1. Define systolic and diastolic pressure and give their normal values. Describe the short-term mechanisms of regulation of blood pressure.

   (2+8=10 marks)

2. (3 x 5 = 15 marks)
   a) Draw a labelled diagram of oxyhemoglobin dissociation curve. Briefly, describe the effects of pH, temperature and 2,3-DPG on it
   b) Define end-diastolic volume and ejection fraction and give their normal values. Describe briefly mechanism of autoregulation of cardiac output
   c) Describe the mechanism of cardiovascular changes immediately following the moderate to severe isotonic exercise
   d) Briefly describe the neural regulation of respiration
   e) Draw a labelled diagram of cardiac muscle action potential. Explain, why cardiac muscle can not be tetanized?

3. (3 x 5 = 15 marks)
   a) A patient complains of dyspnoea at rest, which is aggravated in supine posture. On examination, he was found to have increased JVP and pedal edema. What is your provisional diagnosis and what is clinical name of this dyspnea? Give the physiological mechanisms of edema formation in this condition.
   b) Give the physiological mechanisms of changes in heart rate, cardiac output and blood pressure on acute exposure to very cold environment?
   c) A person was exposed to an environment rich in carbon monoxide. What type of hypoxia he is likely to suffer? Briefly explain the physiological basis of management of this type of hypoxia
   d) Draw a labelled diagram of JVP and give the physiological basis of genesis of each wave of JVP
   e) With the help of a suitable diagram of timed vital capacity, briefly explain the primary difference between restrictive and obstructive lung disease

SECTION B

Neurophysiology (CNS), Special senses and Integrative physiology)

4. Draw a schematic labelled diagram of corticospinal tracts. Explain the mechanisms of difference between upper and lower motor neuron paralysis

   (2+8=10 marks)

5. (3 x 5 = 15 marks)
   a) Draw a labelled diagram to depict functional divisions of cerebellum. Briefly, describe functions of cerebellum
b) With the help of a suitable diagram, explain the effects of lesion at various parts of visual pathway

c) Describe the functions of middle ear

d) With the help of suitable diagrams, explain the mechanisms of referred pain

e) With the help of a suitable diagram, explain the mechanism of synaptic transmission in CNS

6. (3 x 5 = 15 marks)

a) Following brain injury, a patient developed hypersexuality, hyperphagia and visual agnosia and started exploring objects orally. What is your provisional diagnosis? Name the parts of the brain affected in this dysfunction

b) A person developed difficulty in reading newspapers after the age of 40 years. What is the probable visual defect and how will you treat this defect?

c) Briefly describe the physiological basis of health improvement by practice of slow-breathing type of pranayama

d) With the help of a labelled schematic diagram, trace the pathway for fine touch

e) A patient complains of incoordination of movement and instability in maintaining posture. On examination, he was found to have intentional tremor and inability to perform rapid alternate movement. Which structure of the central nervous system is most likely involved in this dysfunction? What will be the state of muscle tone in this disease and what is the physiological basis of change of the muscle tone
BIOCHEMISTRY

PAPER I

Time: 3 hours
Max. Marks: 80

ANSWER ALL QUESTIONS
Illustrate your answer with suitable diagrams

SECTION A

Biomolecules – structure function correlations, Cell organization; Enzymes, Bioenergetics and Biological oxidation; Body fluids, Fluid Electrolyte and Acid Base balance and associated disorders.

1. Describe the various types of inhibition of enzyme activity using Lineweaver Burk plot and state how are they distinguished? Name an enzyme inhibitor used as a drug. (6+3+1=10 marks)

2. (3 x 5 = 15 marks)
   a) What are prostaglandins? State their biochemical functions
   b) Explain the chemi osmotic theory of oxidative phosphorylation
   c) Describe the common secondary structures of protein with suitable diagrams
   d) Mention the enzymatic and non-enzymatic parameters to diagnose acute myocardial infarction and state their significance in terms of time duration after infarction
   e) Explain the role of kidney in acid base balance.

3. (3 x 5 = 15 marks)
   a) Explain rancidity of fats and state how it can be prevented
   b) How is the plasma sodium levels regulated?
   c) Describe the organization of a typical biomembrane with a suitable diagram
   d) Explain the structural composition and function of heparin
   e) Explain the concept of Prion disease

SECTION B

Hepatobiliary, Gastric, Pancreatic function tests; Interpretation of Lab. Data; Digestion and absorption of nutrients, metabolism of carbohydrates and lipids, influence of hormones and associated inborn errors. Integration of intermediary metabolism, Biochemistry and diabetes mellitus

4. Describe the various steps involved in the formation of glucose from lactate. How is the process regulated? (8+2=10 marks)

5. (3 x 5 = 15 marks)
   a) Explain the biosynthesis and utilization of ketone bodies
   b) Describe the biosynthesis of acetyl CoA from Pyruvate
   c) Using biochemical parameters, how are the different types of jaundice distinguished?
   d) Explain the catabolism of cholesterol in the body
   e) Explain the molecular defects and clinical features of galactosemias

6. Write short notes on (3 x 5 = 15 marks)
   a) Explain the role of HDL in prevention of coronary artery disease
   b) Explain the digestion and absorption of dietary triglycerides
   c) How are reducing equivalents transported from the cytosol in to mitochondria?
   d) How is HMP Shunt pathway functionally significant in our system?
   e) The plasma lipid profile of a patient reveals the following: Triglycerides: 200 mg/dl; HDL Cholesterol: 40 mg/dl; Total cholesterol: 300 mg/dl. Calculate the plasma LDL cholesterol level.
1. Mention good dietary sources, factors affecting gut absorption, transport and storage in the body, functional importance and daily requirement and RDA of iron in the body. (10 marks)

2. (3 x 5 = 15 marks)
   a) Describe the Wald’s visual cycle
   b) What is dietary fibre? How is it beneficial to a diabetic patient?
   c) Outline the steps and state the applications of Polymerase Chain Reaction
   d) Explain the functional importance of folate in the body
   e) State the principles, types and applications of chromatography

3. (3 x 5 = 15 marks)
   a) Why is Phenylalanine considered both glucogenic and ketogenic amino acid?
   b) How is the diagnosis of primary hypothyroidism made based on lab parameters?
   c) Mention three types of biochemical reactions where pyridoxine is required, with examples.
   d) Explain the functional role of Vitamin K in the body
   e) Mention three enzymes which require Zinc as a cofactor

4. Describe the steps of DNA replication and add a note on telomerase. (10 marks)

5. (3 x 5 = 15 marks)
   a) Illustrate with suitable examples the various types of DNA repair mechanisms
   b) Explain the steps of catabolism of Methionine
   c) Outline the steps and state the applications of PCR
   d) Explain the sources of ammonia in the liver
   e) Explain phase II detoxification reactions with examples.

6. (3 x 5 = 15 marks)
   a) State the principle and application of hybridoma technique
   b) What is a proto-oncogene?
   c) How is complementary DNA constructed in the laboratory?
   d) Explain the molecular basis of sickle cell anemia
   e) How are dietary fibres beneficial for diabetic patients?
SECOND PROFESSIONAL MODEL QUESTION PAPERS
PATHOLOGY
PAPER I
General Pathology
Time: 3 hours  Max. Marks: 80
ANSWER ALL QUESTIONS
Each Section to be answered in separate Answer Book
Illustrate your answer with suitable diagrams

SECTION A

1. Define inflammation and necrosis. List the causes of cell injury and discuss in detail the cell changes in irreversible cell injury. (10 marks)

2. Write short notes on: (5 x 6 = 30 marks)
   a) Caseous necrosis
   b) Hyperplasia
   c) Dysplasia
   d) Morphological changes in apoptosis
   e) Cellular edema

SECTION B

3. Discuss the etiopathogenesis and morphology of acute myeloid Leukaemia. How you confirm the diagnosis. (10 marks)

4. Write short notes on: (5 x 6 = 30 marks)
   a) Bone marrow changes in Haemolytic anaemia
   b) Peripheral smear findings in Aplastic anaemia
   c) Leukemoid reaction
   d) I.T.P.
   e) G6 PD Deficiency
SECTION A

1. 65 year old male presented with the C/o cough and haemoptysis for 6 months. He also c/o loss of weight and appetite for the same duration. (10 marks)
   a) What is probable diagnosis?
   b) Discuss how you will diagnose this disease
   c) Discuss in detail the risk factors, gross and microscopic features of this disease.

2. Write short notes on: (5 x 6 = 30 marks)
   a) Pathogenesis of bronchiectasis
   b) Microscopic findings in myocardial infarction
   c) Aschoff nodule
   d) Gross features of ulcerative colitis
   e) Ulcers in the small intestine

SECTION B

3. Discuss in detail the clinical, radiologic, gross and microscopic features of Osteoclastoma. (10 marks)

4. Write short notes on: (5 x 7 = 30 marks)
   a) Microscopic findings in Ewings sarcoma
   b) Peripheral smear findings in Aplastic anaemia
   c) Leukemoid reaction
   d) I.T.P.
   e) G6 PD deficiency
MICROBIOLOGY

PAPER I

Time: 3 hours
Max. Marks: 80

ANSWER ALL QUESTIONS

Each Section to be answered in separate Answer Book
Illustrate your answer with suitable diagrams

SECTION A

General Microbiology and Immunology

1. Define sterilization and disinfection. List the methods of sterilization by physical methods and discuss in detail the principle of autoclave. Add a note on sterilization control.

(10 marks)

2. Write short notes on:

(5 x 6 = 30 marks)

a) Role of capsule in virulence
b) Plasmids and drug resistance in bacteria
c) Type I hypersensitivity reaction
d) Polymerase chain reaction
e) Antigen presenting cells

SECTION B

Systematic Bacteriology

3. Discuss the pathogenesis and laboratory diagnosis of enteric fever.

(10 marks)

4. Write short notes on:

(5 x 6 = 30 marks)

a) Toxins of vibrio cholerae
b) Non suppurative sequelae of Streptococcus pyogenes
c) Inclusion bodies of Chlamydia
d) Specific serological tests for syphilis
e) Clinical forms of anthrax
1. List malarial parasites of man. Describe the life cycle of the parasite causing cerebral malaria. Discuss the pathogenesis and laboratory diagnosis of this condition. (10 marks)

2. Write short notes on: (5 x 6 = 30 marks)
   a) Serodiagnosis of HIV / AIDS
   b) NNN medium
   c) Trichomonas vaginalis
   d) Polio vaccines
   e) Prevention of hepatitis B

3. A 2 year old boy was admitted in the hospital with complaints of fever, irritability and vomiting of 1 day duration. On examination, he had neck stiffness and a positive Kernig’s sign could be elicited. An appropriate investigation was carried out to confirm the diagnosis. (10 marks)
   a) What is the most probable diagnosis?
   b) Describe the steps taken to diagnose this condition
   c) What is the treatment in this case?

4. Write short notes on: (5 x 6 = 30 marks)
   a) Germ tube test
   b) Sources of hospital infection
   c) Dimorphic fungi
   d) Role of KOH in mycology
   e) Investigation of a cholera outbreak
PHARMACOLOGY

PAPER I

Time: 3 hours

Max. Marks: 80

ANSWER ALL QUESTIONS

Each Section to be answered in separate Answer Book
Illustrate your answer with suitable diagrams

SECTION A

General Pharmacology and CNS

1. Describe the major mechanisms of action of anti-epileptic drugs. Explain the Pharmacokinetics of phenytoin and state how it affects the dosage adjustment in epilepsy. (6+4=10 marks)

2. Write short notes on: (5 x 6 = 30 marks)
   a) Volume of distribution
   b) Opioid antagonism
   c) Tricyclic antidepressants
   d) Competitive antagonism
   e) Methanol poisoning

SECTION B

Chemotherapy and GIT

3. Classify the drugs used in malaria. Write the pharmacotherapy of malaria caused by Plasmodium vivax. (6+4=10 marks)

4. Write short notes on: (5 x 6 = 30 marks)
   a) H. Pylori infection
   b) Surgical prophylaxis with antibiotics
   c) Hepatic amoebiasis
   d) HIV protease inhibitors
   e) Cell cycle specific agents
PHARMACOLOGY

PAPER II

Time: 3 hours  Max. Marks: 80

ANSWER ALL QUESTIONS

Each Section to be answered in separate Answer Book
Illustrate your answer with suitable diagrams

SECTION A

Endocrine, Cardiovascular system & Blood

1. Enumerate the drugs used in essential hypertension. Write briefly the mechanism of action, uses, adverse effects and contraindications of angiotensin – Converting enzyme inhibitors. (10 marks)

2. Write short notes on: (5 x 6 = 30 marks)
   a) Management of chronic heart failure
   b) Postmenopausal hormonal therapy
   c) Mechanism of action and uses of loop diuretics
   d) Low molecular weight heparin
   e) Uses and adverse effects of stains

SECTION B

Respiratory system, Autonomous Nervous system, Autacoids & their antagonists, therapy of common poisoning & heavy metal antagonists

3. Classify cholinomimetic drugs and explain their clinical uses in detail (10 marks)

4. Write short notes on: (5 x 6 = 30 marks)
   a) Leukotriene inhibitors
   b) Second generation H1 antihistamines
   c) Pharmacotherapy of status asthmaticus
   d) Prophylaxis of migraine
   e) Drug therapy of paracetamol toxicity
FORENSIC MEDICINE

PAPER I

FORENSIC MEDICINE & PSYCHIATRY

Time: 3 hours Max. Marks: 80

ANSWER ALL QUESTIONS

Each Section to be answered in separate Answer Book

Illustrate your answer with suitable diagrams

SECTION A

1. A 25 years old man was stabbed in the chest with a dagger. The Victim was brought to JIPMER EMS department immediately. Discuss the management of this case with emphasis on its medico legal aspects. How would you issue a wound certificate in this case? (10 marks)

2. Write short notes on: (5 x 6 = 30 marks)
   a) Rigor mortis and its Medico legal importance
   b) Difference between entry and exit wounds in firearm injury
   c) Medical Termination of Pregnancy Act 1971
   d) Civil responsibilities of mentally-ill person
   e) Testamentary capacity and its requirements

SECTION B

3. A patient was brought to the Casualty, with altered sensorium, constricted pupils and profuse sweating. The attendant gave history of Diarrhea. Name the probable poison producing these features. Discuss its treatment and post-mortem findings. (10 marks)

4. Write short notes on: (5 x 6 = 30 marks)
   a) Penal Erasure
   b) Magistrate’s inquest
   c) Plumbism
   d) Treatment of methyl alcohol poisoning
   e) Subpoena
THIRD PROFESSIONAL PART I MODEL QUESTION PAPERS

E.N.T

PAPER I

Time: 3 hours
Max. Marks: 80

ANSWER ALL QUESTIONS

Each Section to be answered in separate Answer Book
Illustrate your answer with suitable diagrams

SECTION A

Nose and Ear

1. 12 year old patient presented with complaints of bilateral torrhoea of 4 years duration. The discharge was copious and mucoid. Discuss the diagnosis and management of the above patient. (5+5=10 marks)

2. Write short notes on:
   a) Rhinosporidiosis
   b) Little’s area of septum
   c) Ototoxic drugs
   d) Atrophic Rhinitis
   e) Nasal Myasis (5 x 6 = 30 marks)

SECTION B

Larynx and Pharynx

3. Describe the clinical features and complications of a case of Peritonsillar abscess. Outline its management. (5+5=10 marks)

4. Write short notes on:
   a) Vocal cord nodules
   b) Acute retropharyngeal abscess
   c) Complications following adenoidectomy
   d) Laryngocele
   e) Myringotomy (5 x 6 = 30 marks)
OPHTHALMOLOGY
PAPER I

Time: 3 hours Max. Marks: 80

ANSWER ALL QUESTIONS
Each Section to be answered in separate Answer Book
Illustrate your answer with suitable diagrams

SECTION A
Anterior segment diseases

1. A 50 year old woman complains of progressive painless visual loss in both eyes. Discuss the differential diagnosis. (5+5 = 10 marks)

2. Write short notes on: (5 x 6 = 30 marks)
   a) Complicated cataract
   b) Keratomalacia
   c) Ring Synechia
   d) Vernal catarrh
   e) Field defects in open angle glaucoma

SECTION B
Posterior segment & Adnexal diseases

3. Discuss the fundus pictures and treatment of diabetic retinopathy. (5+5 = 10 marks)

4. Write short notes on: (5 x 6 = 30 marks)
   a) Hypertensive Retinopathy
   b) Optic atrophy
   c) Berlin's edema
   d) Entropion
   e) Rhegmatogenous retinal detachment
COMMUNITY MEDICINE

PAPER I

(General Epidemiology, Biostatistics, Sociology, Nutrition, Demography, Environmental Health)

Time: 3 hours

Max. Marks: 80

ANSWER ALL QUESTIONS

Each Section to be answered in separate Answer Book
Illustrate your answer with suitable diagrams

SECTION A

1. Explain the term “disease control”. Describe different activities for disease control, giving examples for each. (3+7=10 marks)

2. Write short notes on:
   a) Chi-square test
   b) Sex ratio in India
   c) Audio-visual aids to make lecture more effective
   d) Primordial prevention
   e) Odds ratio

   (5 x 6 = 30 marks)

SECTION B

3. In an Epidemiological study conducted to assess the risk of cancer among smokers, the data were as follows: (3+7=10 marks)

   Total population: 74,00,000
   Number of smokers: 14,80,000
   Deaths among smokers due to lung cancer: 3315
   Number of non-smokers: 59,20,000
   Deaths among non-smokers due to lung cancer: 592

   a) What is this type of study? Give reasons
   b) Calculate the possible indicators of risk

4. Write short notes on:
   a) Sensitivity of a screening test
   b) Bacteriological quality of drinking water
   c) Indicators for epidemiological assessment of Iodine Deficiency
   d) Cultural factors affecting maternal health
   e) Pulse Polio Immunization

   (5 x 6 = 30 marks)
COMMUNITY MEDICINE
PAPER II
(Epidemiology of Communicable and Non-communicable diseases, Occupational Health, Maternal and Child Health, Family Welfare, Public Health Administration, Health Education)

Time: 3 hours  
Max. Marks: 80

ANSWER ALL QUESTIONS
Each Section to be answered in separate Answer Book
Illustrate your answer with suitable diagrams

SECTION A

1. Describe the problem of acute respiratory infections (ARI). List the agent, host and environmental factors for the control of ARI among children aged 2 months to 5 years. (10 marks)

2. Write short notes on: (5 x 6 = 30 marks)
   a) Management of diarrhea among children with some dehydration
   b) Prevention of rheumatic fever and rheumatic heart disease
   c) Sickness benefit under ESI
   d) Role of health education in school health
   e) Signs of organic lead poisoning

SECTION B

3. What is the importance of perinatal mortality rate (PMR)? In the context of developing countries what are the social & biological causes of PMR? What are the measures to reduce PMR? (2+4+4=10 marks)

4. Write short notes on: (5 x 6 = 30 marks)
   a) Pearls Index
   b) Network analysis
   c) Community Health Centre
   d) Risk factors for hypertension
   e) Principles of Primary Health Care
THIRD PROFESSIONAL PART II MODEL QUESTION PAPERS

OBSTETRICS AND GYNAECOLOGY

PAPER I

Obstetrics Including Social Obstetrics

Time: 3 hours  Max. Marks: 80

ANSWER ALL QUESTIONS

Each Section to be answered in separate Answer Book
Illustrate your answer with suitable diagrams

SECTION A

1. Define anaemia in pregnancy. How do you manage a case of severe anaemia at 28 weeks of pregnancy? (2 + 8= 10 marks)

2. Write short notes on: (5 x 6 = 30 marks)
   a) Diagnosis of Ectopic Pregnancy.
   b) Partogram
   c) Management of cervical incompetence.
   d) Prevention of postpartum haemorrhage
   e) Screening for gestational Diabetes mellitus

SECTION B

3. Define obstructed labour. Describe the clinical features and management of a case of obstructed labour. (2 +4+4=10 marks)

4. Write short notes on: (5 x 6= 30 marks)
   a) Episiotomy
   b) Follow up of vesicular mole
   c) Uses of Ultrasound in II trimester
   d) Prevention of puerperal sepsis
   e) Outlet forceps
SECTION A

1. A woman aged 30 years complains of mass descending per vaginum for two years.
   a) What is the differential diagnosis?
   b) How do you manage if she had III° uterovaginal prolapse? (3+7 = 10 marks)

2. Write short notes on: (5 x 6 = 30 marks)
   a) Medical Management of endometriosis
   b) Haematocolpos.
   c) Fractional Curettage.
   d) Pap smear
   e) Turner’s syndrome

SECTION B

3. A 35 years old lady complains of mass abdomen of four months duration
   a) Discuss the differential diagnosis?
   b) How will you manage a case of carcinoma ovary? (3 + 7 = 10 marks)

4. Write short notes on: (5 x 6 = 30 marks)
   a) Male condom
   b) Tests for ovulation
   c) Methods of II trimester medical termination of pregnancy
   d) Contra indications for use of hormonal contraceptions
   e) Complications of IUCD
SECTION A

1. Discuss briefly the aetiology, Clinical Features, Complications and management of Infective Endocarditis (2+3+2+3 = 15 marks)

2. Write short notes on: (5 x 6 = 30 marks)
   a) Secondary Hypertension
   b) Diagnosis and Clinical features of Chronic Renal Failure
   c) Treatment of COPD
   d) DOTS
   e) Management of hepatic encephalopathy

SECTION B

3. A 25 year old female patient came with history of sudden onset of weakness of the right half of the body (3+3+4 = 10 marks)
   Enumerate the aetiology of stroke in a young patient (15-45 years)
   How will you arrive at the diagnosis?
   How will you manage a patient with stroke

4. Write short notes on: (5 x 6 = 30 marks)
   a) Immunological markers of Hepatitis ‘B’ infection and their significance
   b) H. Pylori infection
   c) Differential diagnosis of unilateral oedema of the lower limb
   d) Classification and aetiology of Portal Hypertension
   e) Aetiology and diagnosis of Nephrotic syndrome
MEDICINE
PAPER II

Systemic Medicine including Infectious, Tropical Medicine, Psychiatry and Dermatology

Time: 3 hours  
Max. Marks: 80

ANSWER ALL QUESTIONS
Each Section to be answered in separate Answer Book
Illustrate your answer with suitable diagrams

SECTION A

1. Describe briefly the pathogenesis, clinical features and management of Diabetic Ketoacidosis  
(3+4+3 = 10 marks)

2. Write short notes on:  
(5 x 6 = 30 marks)
   a) A man has been bitten by a stray dog on his face. The wound is lacerated. Outline the management
   b) Clinical features of Psoriasis
   c) Classification of Hansen’s Disease
   d) Bipolar disorder
   e) Sex linked recessive inheritance

SECTION B

3. A 22 year old female patient has been brought to the hospital with alleged history of ingestion of an insecticide. Her pupils are small (pin point) and she has profuse sweating  
(3+4+3 = 10 marks)
   a) What is your diagnosis? What other signs do you look for in this patient?
   b) Outline the management of this case
   c) What complications can occur in this patient?

4. Write short notes on:  
(5 x 6 = 30 marks)
   a) Lab Diagnosis and treatment of Acute Gouty Arthritis
   b) Diagnosis of Rheumatoid Arthritis
   c) Aetiology and management of Autoimmune Hemolytic Anemia
   d) Blood component therapy
   e) Complications of Falciparum Malaria
SURGERY
PAPER I

Time: 3 hours
Max. Marks: 80

ANSWER ALL QUESTIONS
Each Section to be answered in separate Answer Book
Illustrate your answer with suitable diagrams

General Surgery-Burns, Shock, Blood transfusion, Breast and Endocrine

Section I

1. A 60 year old woman is brought to casualty with near total burns sustained in a closed room.
   a) How will you evaluate this patient to assess extent and depth of burns? (3 marks)
   b) What other complication she can have due to the nature of the injury? (2 mark)
   c) Outline the management of the case. Discuss how you will evaluate and (5 marks)
   (Total 10 marks)

2. Write short notes on: (5 x 6 = 30 marks)
   a) Blood stained discharge from the nipple
   b) Triage
   c) Glasgow coma scale
   d) Prophylactic antibiotics in surgery
   e) Universal precautions against HIV

Orthopaedic Surgery

Section II

3. A 50 year old woman reports to the outpatient department with back pain of 3 months duration. She was found to be having a kyphotic deformity with local tenderness at D10 level. She had loss of weight and weakness in the lower limbs with spaticity.
   a) What is the most probable diagnosis (2 marks)
   b) Give the differential diagnosis (2 marks)
   c) Give three relevant investigative procedures (3 marks)
   d) Outline the management and prognosis (3 marks)
   (Total 10 marks)

2. Write short notes on: (5 x 6 = 30 marks)
   a) Barlow's test
   b) Soft tissue pathology in congenital talipes equinovarus
   c) Management of fracture of the scaphoid
   d) Radiological signs of scurvy
   e) Classification of open fractures
SURGERY

PAPER II

Time: 3 hrs.  Max. Marks: 80

Surgical Gastroenterology, Oncology

Section I

1. A young man comes to the hospital with sudden onset abdominal pain and vomiting of 2 days duration. On examination he has diffuse tenderness and abdominal guarding.
   a) Discuss briefly the differential diagnosis (3 marks)
   b) What investigations would help in diagnosis? (2 marks)
   c) Outline the principles of management. (5 marks)
   (Total 10 marks)

2. Write short notes on: (5 x 6 = 30 marks)
   a) Oschern-Sherren regime for appendicitis
   b) Courvoiser’s law
   c) Staging of Hodgkin’s disease
   d) Indications for splenectomy
   e) Pancreatic pseudo-cyst

Allied specialities – Urology, Paediatric Surgery, Neurosurgery, Plastic Surgery, Trauma, CTVS, Anaesthesiology, Dentistry

Section II

3. A 60 year old man presents with passage of blood stained urine of recent onset
   a) Enumerate the possible causes (3 marks)
   b) What investigations would be required in this patient to determine the cause? (3 marks)
   c) Outline the principles of management. (4 marks)
   (Total 10 marks)

4. Write short notes on: (5 x 6 = 30 marks)
   a) Flail chest
   b) Meconium ileus
   c) Cleft lip
   d) Epidural analgesia
   e) ERCP
PAEDIATRICS

Time: 3 hours  Max. Marks: 80

ANSWER ALL QUESTIONS

Each Section to be answered in separate Answer Book
Illustrate your answer with suitable diagrams

SECTION A

Vital Statistics and National Health Programmes, Growth & Development, Nutrition, Immunization. Fluid S Electrolyte imbalance, Genetics, Adolescent Medicine, Child Psychiatry

1. a) Enumerate the principles of Growth and Development (5 marks)
   b) Mention the various factors affecting Growth and Development with suitable example for each (5 marks)

2. Write short notes on: (5 x 6 = 30 marks)
   a) Typhoid vaccine – Oral and parenteral
   b) Nutritional Rickets – Biochemical and radiological changes
   c) Metabolic acidosis – 3 cases and treatment
   d) Breath holding spells – Management
   e) Management of Protein Energy Malnutrition

SECTION B

Neonatology, Systemic Paediatrics, Infectious Diseases, Paediatric emergencies, Procedures, Paediatric surgical problems.

3. A 6 year old child came to the hospital with history of high grade intermittent fever of 4 days duration associated with chills and rigors. On examination child had splenomegaly.
   a) What is the most probable diagnosis? (1 mark)
   b) Mention the relevant investigations needed to arrive at the diagnosis (4 marks)
   c) iii) Drugs used in treatment of this condition (5 marks)

4. Write short notes on: (5 x 6 = 30 marks)
   a) Hyaline membrane disease – Diagnosis and treatment
   b) Management of Acute ITP – Diagnosis and treatment
   c) Diagnosis of Bacterial Endocarditis
   d) Management of first episode of Nephrotic syndrome
   e) Management of Cyanotic spells